Journal of

Family and Society Research

Volume 2(2), December 2023

ISSN 2955 – 1676 (Print)

ISSN 2955 – 1668 (Online)

Published by the
Association for Family and Society Scientists
jfsr.2022@afass.org.ng
www.afass.org.ng

Printed by
Great AP Express Publishers Ltd
Oyibo Lodge, Olivet Area, Amogbo Nsukka
0811 698 1800; 08080655723
www.greatappublishers.com

Authors' Guidelines

Title of Paper: The title of the paper should not exceed 25 words. The title should be written in first-letter capital format.

Authors' Name/Affiliation: The name(s) of the author(s) should be written surname and initials. The department and institution of the author(s) should be written under the authors' name, bearing a corresponding superscript against the author's name(s).

Example Okeke, F.O[1]& Eze, C.L[2]
[1]Department of Home Science, University of Nigeria, Nsukka
[2]Department of Psychology, Enugu State University of Technology, Enugu.

Abstract: The abstract should be written in block format, single line spacing, Times New Roman font type, font size 12 and not more than 250 words.

Keywords: The key words should be between three to five words.

Main body: Each paragraph should be indented, 1.5 line spacing, Times New Roman font type, font size 12 and between 12-15 pages.

Introduction: Introduction should address the background of the study, literature review, statement of the problem and rationale for the study. Each section of the introduction should be written in paragraphs and not structured in subheadings.

Theoretical Background of the Study (if applicable): These should address the theory or theories which guide the study hypotheses.

Objectives and/or Hypotheses: These should be outlined clearly.

Methodology/Materials and Methods: These should contain the study design, sources of material and statistical methods used for data analysis. Studies that involve human participants should include techniques for sample selection and how their informed consent was obtained. The procedure for ethical approval for the study should also be clearly stated.

Results: The results should be written concisely. The text should come before tables and figures.

Discussion: The relationship between the result and existing literature should be addressed here. If theoretical background and hypotheses are used, the findings should be discussed in line with the theory and hypotheses.

Recommendation: This should be strictly based on the findings of the study.

Acknowledgement (optional): Institutions or persons that contributed financially or technically to the study should be highlighted.

Citation/References: APA 7th edition reference style should be adhered to both for in-text citation and the reference list

Examples:

❖ **Books**

In-text: One to two authors- Collier, A. (2008) **or** Salas and D'Agistino (2020)

- **Three or more authors**- (Martin et al., 2020) **or** Martin et al. (2020)
- **Group Author with Abbreviation-** First Citation: (National Institute of Mental Health [NIMH], 2020) Subsequent Citations: (NIMH, 2020) **or** First Citation: National Institute of Mental Health (NIMH, 2020) Subsequent Citations: NIMH (2020)

Reference List: One author- Collier, A. (2008). The world of tourism and travel. Rosedale, New Zealand: Pearson Education New Zealand.

- **Two authors-**Barkway, D., & O'Kane, D. (2020). Psychology: Introduction for health professionals. Elsevier.
- **Group Author with Abbreviation-** Ministry of Health. (2007). *Looking at long-term residential care in a rest home or hospital: What you need to know*. National Cancer Institute
- **Book with two editors instead of an author.**

Reference List: Melendy, R., & Kincaid, C. (Eds.). (2018). Birth order and personality. Doubleday.

❖ **Chapter in an Edited Book**

In-text: (Aron et al., 2019) or Aron et al. (2019)

Reference List: Aron, L., Botella, M., &Lubart, T. (2019). Culinary arts: Talent and their development. In R. F. Subotnik, P. Olszewski-Kubilius, & F. C. Worrell (Eds.), *The psychology of high performance: Developing human potential into domain-specific talent* (pp. 345–359). American Psychological Association. https://doi.org/10.1037/0000120-016

❖ **Journal Articles**

In-text: one to two authors- Ogoja and Eket (2021) or (Ogoja&Eket, 2021)

- **Three or more authors**- (Martin et al., 2020) **or** Martin et al. (2020)
- **Group Author with Abbreviation-** First Citation: (National Institute of Mental Health [NIMH], 2020) Subsequent Citations: (NIMH, 2020) **or** First Citation: National Institute of Mental Health (NIMH, 2020) Subsequent Citations: NIMH (2020)

Reference List: One author- McCauley, S. M. (2019). Language learning as language use: A cross-linguistic model of child language development. Psychological Review, 126(1), 1-51.

- **Two authors-**McElrea, F., & Thompson, D. (2019). Our traditional criminal justice system. The New Zealand Law Journal, 378–383.
- **Three to 20 authors-** (list all authors) Lamastra, L., Balderacchi, M., Di Guardo, A., Monchiero, M., &Trevisan, M. (2016). A novel fuzzy expert system to assess the sustainability of the viticulture at the wine-estate scale. Science of the Total Environment, 572, 724–733. https://doi.org/10.1016/j.scitotenv.2016.07.043.
- **21 or more authors-**Kalnay, E., Kanamitsu, M., Kistler, R., Collins, W., Deaven, D., Gandin, L., Iredell, M., Saha, S., White, G., Woollen, J., Zhu, Y., Chelliah, M., Ebisuzaki, W., Higgins, W., Janowiak, J., Mo, K. C., Ropelewski, C., Wang, J., Leetmaa, A., . . . Joseph, D. (1996). The NCEP /NCAR 40-year reanalysis project.

Bulletin of the American Meteorological Society, 77(3), 437-471. http://doi.org/fg6rf9

- **Group Author with Abbreviation-** National Cancer Institute. (2018). Facing forward: Life after cancer treatment (NIH Publication No. 18 -2424). U.S. Department of Health and Human Services, National Institutes of Health. https://www.cancer.gov/publications/patient-education/life-after-treatment.pdf

❖ **Conference Paper proceedings published in a journal**

In-text: (Duckworth et al., 2019) or According to Duckworth et al. (2019)
Reference List: Duckworth, A. L., Quirk, A., Gallop, R., Hoyle, R. H., Kelly, D. R., & Matthews, M. D. (2019). Cognitive and noncognitive predictors of success. *Proceedings of the National Academy of Sciences*, USA, 116(47), 23499–23504. https://doi.org/10.1073/pnas.1910510116

❖ **Figures (images, illustrations, photographs, maps, charts)**

In-text: (Zimbio, 2013)
Reference List: Zimbio. (2013). NZFW A/W 2013: Charlie Brown – Backstage [Image]. Retrieved from http://www.zimbio.com/ pictures/ZIL6dIX5VQT/NZFW+W+2013+Charlie+Brown+Back stage

Galley Proof: Galley proofs of the accepted manuscripts will be sent to the corresponding author's email. The manuscript will be verified by the corresponding author before publication. Any author-related error after publication will not be attended to.

Editorial

Greetings to our professional and associate colleagues in academia.

Thanks be to God for the successful publication of the first issue of Volume Two of the *Journal of Family and Society Research*. The journal is a publication of the Association for Family and Society Scientists. It is a multidisciplinary avenue through which various professionals in academia and other allied professionals communicate their research output to the world. The journal publishes all research works on global issues relating to individuals, families and society at large.

Journal of Family and Society Research is aimed at publishing articles with quality content and clear methodological procedures. Every article published undergoes a series of reviews from our able editorial team who have a proven record of academic achievements in their various disciplines.

Publishing the second issue of Volume 2 indicates that the vision and mission of AFASS are advancing. We therefore encourage you to keep being part of the annual international conferences and workshops of AFASS. JFSR has both print and online publications.

Note that papers are welcome all year round through the journal email jfsr.2022@gmail.com.

Best wishes,

Dr. Uju I. Nnubia
Managing Editor
Journal of Family and Society Research

Professor Philip Mefoh
Editor in Chief
Journal of Family and Society Research

Professor Franca O. Okechukwu
Founding President,
Association for Family and Society Scientists.

Editorial Board

Editor-in-Chief

Prof. P.C. Mefoh
Department of Psychology,
University of Nigeria, Nsukka

Editors

Prof. F.O. Okechukwu
Department of Home Science & Management
University of Nigeria, Nsukka

Dr U.I. Nnubia
Department of Home Science & Management
University of Nigeria, Nsukka

Assistant Editors

Prof B.A. Ogwo- Department of Career and Technical Educator Preparation, State University of New York, Oswego

Prof. B.O. Mbah - Department of Home Science and Management, University of Nigeria, Nsukka

Prof. Bernedeth Ezegbe -Department of Social Science Education, University of Nigeria, Nsukka

Dr Chikezie Uzuegbunam -University of Cape Town

Dr A.N. Maduforo- Department of Nutrition & Dietetics, University of Calgary, Canada

Advisory Board

Prof. Adiebonye E. Jumbo - Department of Medical Informatics, Down State University, New York

Prof. Elizabeth Kembe - Department of Home Science and Management, Federal University of Agriculture, Makurdi

Prof. C.A. Igbo - Department of Home Economics and Hospitality Management Education, University of Nigeria, Nsukka

Prof. S.U. Onoja - Department of Nutrition & Dietetics, University of Nigeria, Nsukka

In this Issue

- Sleep Habits of School-Age Children and Time Spent on Electronic Media in Nsukka Urban, Enugu State - *Okechukwu, F.O., Aondoakaa, B.N., Epistle, E.C. & Edeh, I.F.* 8 - 20
- Relationship between Family Communication Patterns and Conflict Management Styles of Adolescents in Udenu Local Government Area, Enugu State - *Umennuihe, C.L, Eya, D.N.. Nwobi, C.A. , & Obiora, J.I.*21-34
- Perceived Influence of Hostel Sanitation Practices on Students' Health at the University of Nigeria, Nsukka - *Nwadi, C.L., Attah, B.I., Ugwu, E.I, Nwakpadolu, G.M., & Ezekoye, R.O.* 35-46
- Age, Emotional Intelligence, Awareness and Communication as Factors in Marital Satisfaction Among Military Personnel in South-South, Nigeria - *Ogba, K.T.U., Onyedire, N.G., Ituma, E.A., & Ogba, M.O.* 47-65
- Factors Associated with Parents' Intention to Adopt the Parental Control/Monitoring Application - *Aluko K. E* 66-81
- Use of Digital Marketing Resources for Business Management among Electrical Appliances Dealers in Enugu State - *Madu, M.A., & Nnamani, V.O.* 82 - 92
- Effect of Different Processing Methods (Roasting and Shade-Drying) on Fatty Acid Profile of Tumeric (*Curcumin longa*) - *Onyeke, N. G., Onodugo, N. G &Idoko C.C* 93 - 107
- Prevalence and Knowledge of Anaemia in Pregnancy among Pregnant Women in Nkanu-west Local Government Area, Enugu State - *Jacinta E. Ugbelu* 108-119
- Evaluation of Plant-Based Protein Consumption among Rural Households in Igbo-Eze North Local Government Area, Enugu State, Nigeria - *Uloh, E.V., Ede, E.A., Onyeke, A.C., & Bar-Anyam, N.M* 120-131
- Determination of Nutrient and Phytochemical Profile of Basil *(Ocimum gratissimum)*Leaves and Seeds- *Okoye O.I., Ezegbe A.G. & Ugwu C.F.*132-144
- Emotional Abuse among Secondary School Students in Igumale Community, Benue State, Nigeria: A Cross-sectional Survey - *Elufidipe-Olumide, H. A., Ozoko, M., Dike, F., & Ononuju, A. H.* 145-156
- The Role of Clothing and Textile in Poverty Alleviation among Women in Abakaliki Local Government Area - *Elobe-Mbam,S.C. & Oluah, B. E* 157-171

J. of Family and Society Research 2 (2), December 2023, pp. 8 - 20

Sleep Habits of School-Age Children and Time Spent on Electronic Media in Nsukka Urban, Enugu State

Okechukwu, F.O.[1], *Aondoakaa, B.N.[2], Epistle, E.C.[1]& Edeh, I.F.[1]
[1] Department of Home Science and Management, University of Nigeria, Nsukka
[2] Department of Vocational and Technical Education Benue State University, Makurdi

Correspondence: aokfelicity@gmail.com

Abstract

This study investigated the relationship between the sleep habits of school-aged children and the time they spend on electronic media in Nsukka local government area, Enugu state. Four research purposes guided the study. The study adopted a cross-sectional survey research design. The sample size was 700 primary four and five pupils from 12 registered primary schools in the study area. The questionnaire was the instrument used for data collection. The instrument was validated by three experts from the Department of Home Science and Management, University of Nigeria, Nsukka. Cronbach Alpha reliability test was used to obtain a high coefficient of 0.82. Data collected were coded into the Statistical Product and Service Solution (IBM-SPSS) version 23.00. Frequencies, percentages, means, standard deviation, and chi-square were used for data analysis. The findings showed that the household income of more than half (56.1%) of the respondents was above ₦50,000 per month. Regarding the sleep habits of respondents, 69.40% of them had healthy sleep habits while 30.6% of them had unhealthy sleep habits. The majority (92.9%) of the children used electronic media in moderate amounts while 7.1% used electronic media excessively. The most commonly used electronic media by the respondents was television (31.0%) and the least used was headphones (9.6%). The respondents engaged in media activities such as watching cartoons, animation, films, and video clips; playing games; listening to music; taking pictures; and chatting with friends. Findings showed that no significant relationship existed between respondents' sleep habits and electronic media use. It was recommended that school administrators should organize seminars/talks for the teachers, caregivers, and parents on the importance of healthy sleep habits to children.

Keywords: Sleep habits, Electronic media, School-aged children, Media activities

Introduction

A child is a young human being below the age of puberty or the legal age of maturity. It also refers to younger people who do not have the maturity and understanding to make important decisions for themselves (Lansdown & Vaghri, 2022). Childhood is generally a time of playing, learning, socializing, and exploring in a world without much

adult interference, aside from parents. It is a time for carefree learning without the saddles of adult responsibilities. An individual's childhood is broadly classified into early childhood (birth-6years), middle childhood (6-12years), and adolescence (10-19years). Children in the middle childhood stage are referred to as school-aged children (United Nations International Children's Emergency Fund, 2007).

School-aged child development describes the expected physical, emotional, and mental abilities of 6 to 12 years old. In this period, children develop socially and mentally. They are at a stage where they make new friends and gain new skills, which will enable them to become more independent and enhance their individuality. School-aged children are highly active. They require a lot of developmental basic needs which include: sleep, shelter, food, clothing, and health care which can be physical and mental. Maintaining children's health implies offering them healthy foods, physical exercises, and ensuring they get enough sleep (Lund, 2017).

Sleep is a naturally recurring state of mind and body, characterized by altered consciousness, relatively inhibited sensory activity, reduced muscle activity and inhibition of nearly all voluntary muscles, and reduced interactions with surroundings. It is distinguished from wakefulness by a decreased ability to react to stimuli, but is more reactive than a coma or disorders of consciousness, with sleep displaying different, active brain patterns. Sleep is associated with a state of muscle relaxation and reduced perception of environmental stimuli (Krueger et al., 2016). Sleep helps children think more clearly, have quicker reflexes, and focus better. Sleep is beneficial to all aspects of body functions such as molecular energy balance, as well as intellectual function, alertness, and mood. The fact is that well-rested children are operating at a different level than those trying to get by on 1 or 2 hours less nightly sleep (Wein, 2013). It is important to remember that genetic background, nutrition as well as sleep habit may affect a child's growth.

A sleep habit is a behaviour on bedtime, time to rise, and duration of nap and night sleep. The balance between sleeping and waking is regulated by a process called homeostasis (Schwartz & Roth, 2008). Suboptimal sleep is associated with poor cognitive functioning and mental health. Sleep habits of school-aged children vary across school days and weekdays. Children are commonly supposed to extend sleep duration on weekends to compensate for sleep debt accumulated over the school days (Li & Gooneratne, 2019). Generally speaking, the longer an organism is awake, the more it feels a need to sleep (sleep debt). Induced or perceived lack of sleep is called sleep deprivation (Schwartz & Roth, 2008). A lot of children do not sleep well or experience unhealthy sleep habits that result in perpetual tiredness; and when they are tired, they will be unable to function at their best. Unhealthy sleep habits lead to sleep insufficiency producing a variety of symptoms and

signs. The central nervous system is affected the most in school-age children, although other systems may be involved. Several factors affect sleep habits in school-aged children including irregular sleep schedule, sleeping environment genetics, medical problems, parent/caregiver factors, snoring, and sleep duration/time (Sondergaard, 2003).

Time is the measured or measurable period during which an action, process, or condition exists or continues (Dainton, 2010). Sleep duration/time affects how school children feel, think, make decisions, and interact with the world around them. According to Paruthi et al. (2016), the American Academy of Sleep Medicine recommends that school-aged children should get 9-12 hours of sleep per day to develop and function properly. Sleeping the number of recommended hours regularly is associated with better health outcomes including improved attention, behaviour, learning, memory, emotional regulation, quality of life, and mental and physical health. On the other hand, regularly sleeping fewer than the recommended hours is associated with attention, behaviour, and learning problems. Insufficient sleep also increases the risk of accidents, injuries, hypertension, obesity, diabetes, and depression (Paruthi, 2016). The less time spent by school-age children on sleep can be caused by insomnia, play, sleep disorders, and time spent on electronic media among other things.

Electronic media covers the various technologies powered by electricity or any equipment used in the electronic communication process. These include digital, video, and audio recordings, slide presentations, CD-ROM and online content, television, radio, telephone, computer, game console, and mobile device is considered electronic media (Medoff & Kaye, 2013). With the increasing use of cellphones, computers, video games, and television, children have more reasons to stay inside rather than outdoors exploring and also to stay awake using those media rather than sleeping. Electronic media is an integral part of children's lives in the twenty-first century. Virtually in every home are television, video games, radio, and computers. The use of electronic media could affect children's lives; it could be a benefit that leaves children better educated or could be hazardous to children's sleep (Cole, 2023).

The American Academy of Pediatrics recommends restricting older children's screen time to no more than one or two hours a day (Christensen, 2021). However, the use of electronic media (EM) continues to take up a large part of children's waking time according to Kubiszewski (2014). Thousands of videos, TV shows, and websites have been designed and published for school-aged children. In recent years, there has been an exponential increase in the electronic media available to families, even for the youngest children in society (Spina et al., 2021). Parents might want to know whether digital technology is making children's lives better or miserable especially since children are generally not aware of the possible

negative effects of technology (Cole, 2023). In practice, youngsters have multiple uses rather than a single use of electronic media every day.

Whether or not the use of electronic media affects children's health has been a subject of debate for some time. In a longitudinal study of 759 adolescents with mean ages of 14, 16, and 22 years, it was found that extensive TV viewing during childhood may be associated with an increased risk of sleep problems in early adulthood (Johnson et al., 2004). In addition, a study by Dworak et al. (2007) showed that excessive TV and computer exposure affect children's sleep patterns. In particular, playing computer games resulted in prolonged latency of sleep onset, more sleep time in stage two, and less slow-wave sleep as a percentage of total sleep time in subsequent sleep. Using game consoles before bedtime has been linked to increased sleep latency, later bedtime, and shorter sleep duration (Kubiszewski, 2014). The negative effects of EM suggested by these studies are thus a matter of considerable concern.

Electronic media have often been considered to hurt the sleep habits of children and adolescents, but there are no comprehensive reviews of research in Nsukka Urban. Many variables have been investigated across these studies, and delayed bedtime and shorter total sleep time have been most consistently related to media use by school children. This study, therefore, determined the media use of school-aged children and its relationship with their sleep habits in Nsukka Urban.

Objectives of the study

The main objective of this study was to determine the sleep habits of school-aged children and time spent on electronic media in the Nsukka local government area, Enugu state. Specifically, the study sought to:

1. determine the sleep habits of school-aged children in Nsukka local government area;
2. determine the time spent on electronic media by school-aged children;
3. identify the different media activities they engage in; and
4. Determine the relationship between the time spent on electronic media and the sleep habits of school-aged children in Nsukka local government area.

Methodology

Study design:The study adopted a cross-sectional survey research design. According to Nworgu (2006), a descriptive survey research design is a research method in which a group of people is studied by collecting and analyzing data from a few people or items considered a good representative of the entire group under study.

***Study Population*:** The population for this study was 7,830 primary four and five pupils in 37 public primary schools and 54 private primary schools in Nsukka Urban, Enugu State (Ministry of Education, Enugu State, 2021; School Statistics, 2022).

***Sample Size and Sampling Procedure*:** Multi-stage sampling technique was used to select 700 pupils to participate in the study. The first stage involved

the calculation of 20% (7) of the 37 public schools and 10% (5) of the 54 private schools which gave a total of 12 schools with a population of 1,712. In the second stage, the WHO (2013) guideline for the calculation of sample size in a survey was used to get the sample size of 700 respondents. This sample was equally selected; 350 students each from public and private schools. A Purposive sampling technique was used to select the 700 children from the 12 selected primary schools in Nsukka Urban. The criteria for purposively selecting the participants were that the respondents identified as having access to technologies and advanced electronic media in their homes and/or schools. Those who reported they did not have access to the technologies either at home or at school were not included in the study.

***Instrument for Data Collection*:** A structured questionnaire was used to obtain data from the respondents. The questionnaire was divided into four parts. Part I elicited data on the socio-demographic features of the respondents. Part II contained items on the sleep habits of school-aged children. Part III elicited information on the time respondents spent on media while Part IV identified the media activities the respondents engaged in. The instrument was validated by three lecturers from the Department of Home Science and Management, University of Nigeria, Nsukka. To determine the reliability of the questionnaire, the questionnaire was administered to 20 primary four and five pupils in Udenu local government area. Cronbach Alpha coefficient of 0.82 was obtained showing high internal consistency of the questionnaire items.

***Method of data collection*:** Two research assistants were recruited and trained adequately on the study objectives, contents of the instruments, and distribution procedures. The questionnaires were hand-distributed to the children in their classrooms by the researcher and the trained assistants. The respondents were given sufficient time to fill out the questionnaires and then the questionnaires were collected the next day to increase the chances of accurate filling and return. All the distributed questionnaires were collected, giving a 100% return rate.

***Data and statistical analysis*:** The data from the questionnaire were input into the Statistical Product and Service Solution (IBM-SPSS) version 23.0. Descriptive results were presented in frequencies, percentages, mean, and standard deviation. Means of 2.00 and above were regarded as agreed while means below 2.0 were regarded as disagreed. For the respondents' sleep habits, part 2 of the questionnaire was made up of 18 items (8 healthy and 10 unhealthy habits). Responses were on a five-point Likert scale from never (1), to always (5). The respondents were regarded as having either healthy or unhealthy sleep habits based on the group they scored higher. For the respondents' electronic media use, part 3 of the questionnaire was made up of 9 items. Responses were on a five-point Likert scale from never (0), to ≥ 5hrs/day (4). The responses were

summed up to obtain the total scores of the respondents on media use. Scores for electronic media use ranged from 0-48. Scores of 0-8 showed low media use; 9-18 – moderate media use; and 19-48 – excessive media use. The scoring formula was determined bearing in mind the recommended screen time (2 hours or less per day) for children according to the American Academy of Pediatrics. Chi-square was used to test the relationship between categorical variables at $p < 0.05$ level of significance.

Result

Demographic data of the respondents: The demographic characteristics of the respondents showed that the majority (97.6%) of them were between the ages of 6-12 years old. The majority (92.0%) of the respondents had their both parents alive, few of them (3.7%) had only their fathers alive, 4.7% had only their mothers alive and 1% of them had none of their parents alive. The majority (95.3%) of the respondents' education was sponsored by their parents. Business trading was the occupation for the majority of the respondents' parents, 40.7% for the fathers and 39.7% for their mothers. Thirty-seven per cent of their mothers earned less than ₦30,000 monthly and more than half of their fathers earned above ₦50,000. The majority (92.1%) of their parents were currently married and living together, 77.4% had fathers and 79.1% had mothers who obtained tertiary education.

Sleep habits of school-aged children

Table 1 shows the mean and standard deviation responses on the sleep habits of the respondents. The healthy sleep habits the children practice often are going to bed at the same time at night with a mean of 2.00, falling asleep alone in their bed (2.97), sleeping about the same amount each day (2.58), and waking up by him/herself (2.84). The unhealthy sleep habits they often practice are waking up earlier than required in the morning with a mean of 2.84 and waking up more than once during the night (2.44).

Table 1: Mean and standard deviation responses on the sleep habits of the respondents

Sleep habits	Mean	Std Dev	Remark
Healthy sleep habits. Child;			
goes to bed at the same time at night	2.00	1.34	Often
falls asleep alone in bed	2.97	1.15	Often
needs special objects like dolls or music to fall asleep	0.64	0.97	Not often
sleeps about the same amount each day	2.58	1.8.0	Often
wakes up by him/herself	2.84	1.11	Often
falls asleep within 20 minutes of going to bed	2.11	1.34	Often
wakes up once during the night	1.35	1.19	Not often
needs parents or siblings in the room to fall asleep	0.71	1.01	Not often
Unhealthy sleep habits. Child;			
is afraid of sleeping in the dark	1.62	1.58	Not often

resist going to bed at bedtime	1.43	1.39	Not often
moves to someone else bed during the night	0.58	0.99	Not often
is restless and moves a lot during sleep	0.95	1.06	Not often
snores loudly	0.31	0.73	Not often
awakens during the night, sweating and screaming	0.31	0.75	Not often
wakes up very earlier than required in the morning	2.84	1.13	Often
seems tired during the daytime	0.69	1.06	Not often
falls asleep while involved in activities	0.39	0.79	Not often
Wakes up more than once during the night	2.44	1.34	Often

Table 2 shows the frequency and percentage presentation of the sleep habits of the children. More than half (69.4%) of the respondents have healthy sleep habits while 30.6% have unhealthy sleep habits.

Table 2: Frequency and percentage presentations of the sleep habits of the children

Sleep habits	*f*	%
Healthy sleep habits	486	69.4
Unhealthy sleep habits	214	30.6
Total	**700**	**100.0**

Table 3 shows the frequency and percentage of responses on time spent on electronic media by the respondents. A greater proportion (31.0%) of the respondents spend 1-2 hours watching television every day. The majority (74.3%) of the respondents never used computers and 77.1% never used an iPad. More than half of them (53.9%) spend less than an hour every day on their smartphone. The majority (90%) of the children never used headphones and radio (70%).

Table 3: Frequency and percentage responses on time spent on electronic media

Electronic Media	**≥5hrs F (%)**	**3-4hrs/day F (%)**	**1-2hrs/day F (%)**	**<1hrs/day F (%)**	**Never F (%)**
Television	131 (18.7)	167 (23.9)	217 (31.0)	178 (25.4)	7 (1.0)
Personal computer	0 (0.0)	3 (4.0)	22 (3.1)	155 (22.1)	520 (74.3)
Tablet and iPad	1 (1.0)	4 (6.0)	24 (3.4)	131 (18.7)	540 (77.1)
Smartphone	5 (0.7)	5 (7.0)	157 (22.4)	377 (53.9)	156 (22.3)
Phone/video games	6 (0.9)	10 (1.4)	115 (16.4)	316 (45.1)	253 (36.1)
Radio	1 (1)	4 (0.6)	47 (6.7)	158 (22.6)	490 (70.0)
DVD player	50 (7.1)	91 (13.0)	197 (28.1)	231 (33.0)	131 (18.7)
Headphones	0 (0.0)	0 (0.0)	3 (0.4)	67 (9.6)	630 (90.0)
Camera	2 (3)	5 (0.7)	0 (0.0)	163 (23.3)	530 (75.7)

Table 4 shows the extent of the use of electronic media by the respondents. The majority (92.9%) of the respondents used electronic media moderately while 7.1% of them made excessive use of electronic media.

Table 4: Extent of use of electronic media

Electronic media use	*f*	%
Moderate electronic media use	650	92.9

Excessive electronic media use	50	7.1
Total	**700**	**100.0**

Table 5 indicates the media activities engaged in by school-aged children in Nsukka local government area. Up to 87.1% of children watch cartoons and animation with electronic media. The respondents used electronic media for the following activities; watching films and video clips (79.7%), playing games (66.6%), watching educational videos (62.4%), watching funny videos (60.9%), listening to music (57.6%), attending online educational lessons (53.6%), recording videos and voice message (48.4%), and taking pictures (32.3%).

Table 5: Frequency and percentage responses on the media activities for children

Activities	Frequency	Percentage
Watching funny videos	426	60.9
Listening to music	403	57.6
Watching educational videos	437	62.4
Playing games	466	66.6
Watching films and video clips	558	79.7
Watching cartoons and animations	610	87.1
Chatting with friends	127	18.1
Taking pictures	226	32.3
Recording videos and voice messages	339	48.4
Attending online educational lessons	375	53.6

Table 6 shows the relationship between sleep habits and the electronic media use of the respondents. The analysis revealed a chi-square value of 1.864, since the p-value (0.172) is greater than the 0.05 level of significance, this shows that there was no significant relationship between sleep habits and the electronic media use of school-aged children. However, findings showed that less proportion (22.0%) of children with unhealthy sleep habits make use of electronic media in excessive amounts.

Table 6: Relationship between sleep habits and electronic media use of the respondents

	Healthy sleep habit F (%)	Unhealthy sleep habit F (%)	Total F (%)
Moderate media use	447 (68.8)	203 (31.2)	650 (100.0)
Excessive media use	39 (78.0)	11 (22.0)	50 (100.0)
			$\chi^2 = 1.864$, df = 1, p = 0.172

Discussion

Healthy sleep habit is all about putting oneself in the best position to sleep well every day and night. Optimizing one's sleep schedule, pre-bed routine, and daily routines is part of harnessing habits to make quality sleep feel more

automatic. Good sleep habits help children to get enough quality sleep (Mindell et al., 2015). Findings showed that almost a third of the children had unhealthy sleep habits among which are waking up earlier than required in the morning and waking up more than once during the night. This is worrying because poor sleep in early childhood has been linked to immune system issues, allergic rhinitis, anxiety, and depression. There is also emerging evidence that lack of quality sleep as a child may lead to future cardiovascular problems such as obesity, diabetes, and high blood pressure (Pacheco, 2023). Supporting the finding, the American Academy of Pediatrics estimates that sleep problems affect 25 to 50 per cent of children. The finding is also in line with the report of McKinnen (2023) which stated that waking up at odd hours during the night and using technology in bed are some poor sleep habits that can lead to inadequate sleep in children. In addition, having an irregular sleep schedule or consuming too much caffeine, can interfere with children's sleep quality according to Suni (2023). Findings also showed healthy sleep habits such as going to bed at the same time at night with a mean of, falling asleep alone and sleeping about the same amount each day. This finding is in line with the recommendation of Hale and Guan (2015) for quality sleep in children such as setting a bedtime routine, relaxing before bedtime, and keeping regular sleep and wake times.According to Holly Springs Pediatrics (2022), healthy sleep habits for children include keeping a nightly outline and scheduling quiet time before bed. The American Academy of Pediatrics (2016) postulated keeping a regular daily routine, monitoring screen time, and creating a sleep-supportive bedroom environment among other things as healthy sleep habits for children.

Electronic media is present and apparent in the 21st century, especially among children and adolescents. Findings showed that children spend time on electronic media such as television, computers, iPads, and smartphones. This is in line with the findings of studies by Falbe et al. (2015) and Kubiszewski et al. (2014) which showed that participants make use of electronic media such as mobile devices, television, video games, and computers. Findings also showed that the majority of the children never spend time using the radio and headphones respectively. The low use of radio might be attributed to the fact there are better options for obtaining information and entertainment, such as phones. Given that studies over the years showed that excessive headphone use could cause hearing loss in children, parents may not want their kids to use them, which may be why low usage was recorded. In contrast, a study by Kubiszewski et al. (2014) showed that the participants made extensive use of radio and music players.

Media activities for children are those things that engage in using the electronic media available to them. This study showed that the activities the children used electronic media for included watching cartoons and animation, watching films and video

clips, playing games, watching educational videos, watching funny videos, listening to music, attending online educational lessons, recording videos, and voice messages and taking pictures. Supporting these findings, Kennedy and Hupert (2021) reported that children make use of electronic media for entertainment, learning, sharing videos, playing games, reading, drawing, and storytelling. Similarly, Radesky (2016) recommended that children may use electronic media for creating and learning together, taking photos, recording videos and songs, researching, video chatting, and building vocabulary.

Electronic media use is becoming an increasingly important part of life for today's school-aged children. At the same time, concern about children's sleep habits has arisen. Findings showed that electronic media use was not associated with the sleep habits of the children. This was attributed to the fact that almost equal proportion of the children who used electronic devices excessively and those who used them moderately had unhealthy sleep habits. This finding is in contrast with that of Nuutinen et al. (2013) which showed that Computer use and television viewing predicted significantly shorter sleep duration and later bedtimes among school-aged children. Their finding also showed that Computer use predicted unfavourable changes in sleep duration and bedtimes on school days and weekends. Additionally, Kubiszewski et al. (2014) found that cell phone use among the participants predicted sleep problems and was associated with a higher risk of sleep problems such as going to bed late and difficulty waking up. They further stated that possession and pattern of electronic use by children are associated with impaired sleep quality and late bedtimes, indicating the need to control their screen time. The difference in findings could be attributed to the high educational qualification of the parents in this study which could influence children's adherence to family regulations and time management practices. Supporting this, a study by Cameron et al. (2022) showed that higher parental education was associated with longer childhood sleep duration and better sleep quality in children.

Conclusion

This study investigated the sleep habits and time spent on electronic media by school-aged children in Nsukka Urban. Findings showed that the majority of the children had healthy sleep habits and made moderate use of electronic media. Furthermore, the most commonly used electronic media by the respondents was television, smartphone, and DVD player. The respondents engaged in media activities such as watching cartoons, animation, films, and video clips; playing games; listening to music; taking pictures; and chatting with friends. A significant proportion of the children had unhealthy sleep habits, though they mostly used electronic media moderately. However, their sleep habits were not associated with the extent of electronic media use.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Primary education administrators should organize seminars/talks for the teachers, caregivers, and parents on the importance of healthy sleep habits to children.
2. Family and Child Study professionals should increase awareness through workshops and training to all who work with children on the developmental needs and benefits of balancing media time and sleep time.
3. The government should through appropriate authorities enforce policies in the primary school curriculum that grant students nap time during school hours.

References

American Academy of Pediatrics (2016).*Healthy sleep habits: How many hours does your child need?*Healthy Children. https://www.healthychildren.org/English/healthy-living/sleep/Pages/healthy-sleep-habits-how-many-hours-does-your-child-need.aspx

Cameron, E.E., Watts, D., Silang, K., Dhillon, A., Sohal, P.R., MacKinnon, A.L., Roos, L.E., & Tomfohr-Madsen, L.M. (2022). Parental socioeconomic status and childhood sleep: A systematic review and meta-analysis. *Sleep Epidemiology, 2*. https://doi.org/10.1016/j.sleepe.2022.100047.

Christensen, J. (May 28, 2021). Children and screen time: How much is too much? Mayo clinic health system. Retrieved from https://www.mayoclinichealthsystem.org/hometown-health/speaking-of-health/children-and-screen-time#:~:text=The%20American%20Academy%20of%20Pediatrics,or%20two%20hours%20a%20day.

Cole, L. (2023). *Positive and negative effects of technology on children.*Mentalup. https://www.mentalup.co/blog/positive-and-negative-effects-of-technology-on-children

Dainton, B. (2010). *Time and space*, 2nd Eds. McGill-Queens University Press.

Dworak, M., Schierl, T., Bruns, T., & Struder, H.K. (2007). Impact of singular excessive computer game and television exposure on sleep patterns and memory performance of school-aged children. *Pediatrics, 120*(5), 978–985.

Falbe, J., Davison, K. K., Franckle, R. L., Ganter, C., Gortmaker, S. L., Smith, L., Land, T., & Taveras, E. M. (2015). Sleep duration, restfulness, and screens in the sleep environment. *Pediatrics*, *135*(2), e367–e375. https://doi.org/10.1542/peds.2014-2306

Hale, L., & Guan, S. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, *21*, 50–58. https://doi.org/10.1016/j.smrv.2014.07.007

Holly Springs Pediatrics (March 15, 2022). *8 Healthy sleep habits for kids.* Holly Springs Pediatrics. https://www.myhspediatrics.com/healthy-sleep-habits-for-kids/

Johnson, J.G., Cohen, P., & Kasen, S. (2004). Association between television viewing and sleep problems during adolescence and early adulthood. *Archives of Pediatrics and Adolescent Medicine, 158*(6), 562–568.

Kennedy, J. & Hupert, N. (February 2, 2021). *Using digital media to support early learning.* Edutopia. Retrieved from https://www.edutopia.org/article/using-digital-media-support-early-

learning/

Krueger, J.M., Frank, M.G., Wisor, J.P., & Roy, S. (2016). Sleep function: Toward elucidating an enigma. *Sleep Medicine Reviews, 28,* 46-54. https://doi.org/10.1016/j.smrv.2015.08.005.

Kubiszewski, V., Fontaine, R., Rusch, E., & Hazouard, E. (2014). Association between electronic media use and sleep habits: An eight-day follow-up study. *International Journal of Adolescence and Youth, 19*(3), 395-407, DOI: 10.1080/02673843.2012.751039

Lansdown, G., & Vaghri, Z. (2022). Definition of a child. In Vaghri, Z., Zermatten, J., Lansdown, G., Ruggiero, R. (Eds.). *Monitoring state compliance with the UN Convention on the Rights of the Child. Children's well-being: Indicators and research,* vol 25. Springer, Cham. https://doi.org/10.1007/978-3-030-84647-3_40

Li, J., & Gooneratne, N.S. (2019). Sleep and health in older adults. In M. A. Grandner (Eds.), *Sleep and health* (pp. 31-43). Academic Press. ISBN 9780128153734. https://doi.org/10.1016/B978-0-12-815373-4.00004-6.

Lund, D. (November 11, 2017). A healthy child gets ample sleep, nutrition, and activity. Sanford health. Retrieved from https://news.sanfordhealth.org/childrens/healthy-child-gets-ample-sleep-nutrition-activity/

McKinnen, G. (January 20, 2023).*Avoid these bad sleep habits for a better night's rest.* Early Bird Amerisleep. Retrieved fromhttps://amerisleep.com/blog/bad-sleep-habits/

Medoff, N.J., & Kaye, B. (2013). Electronic media: Then, now, and later. *United Kingdom:* Taylor & Francis. ISBN 978-1-136-03041-3.

Mindell, J.A., Li, A.M., Sadeh, A., Kwon, R., & Goh, D.Y.T. (2015). Bedtime routines for young children: A dose-dependent association with sleep outcomes. *Sleep, 38*(5), 717-722. doi: 10.5665/sleep.4662.

Ministry of Education (2021). Public and private schools population for Enugu-East local government area, Enugu State. Ministry of Education, Enugu state.

Nuutinen, T., Ray, C., & Roos, E. (2013). Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children's sleep habits in a longitudinal study? *BMC public health, 13,* 684. https://doi.org/10.1186/1471-2458-13-684

Nworgu, B.G. (2006). *Educational research: Basic issues and methodology*. Nsukka: University Trust Publishers.

Pacheco, D. (March 29, 2023). *Children and sleep: An introduction to the importance of sleep in children and how to help them sleep better.* Sleep Foundation. Retrieved from https://www.sleepfoundation.org/children-and-sleep#:~:text=Some%20of%20the%20most%20common,snoring%2C%20and%20restless%20leg%20syndrome.

Paruthi, S., Brooks, L.J., D'Ambrosio, C., Hall, W.A., Kotagal, S., Lloyd, R.M., Malow, B.A., Maski, K., Nichols, C., Quan, S.F., Rosen. C.L., Troester, M.M., & Wise, M.S. (2016). Recommended amount of sleep for pediatric populations: a consensus statement of the American Academy of Sleep Medicine. *Journal of Clinical Sleep Medicine, 12*(6), 785–786. http://dx.doi.org/10.5664/jcsm.5866

Radesky, J. (October 21, 2016). How should we teach our kids to use digital media? The conversation. Retrieved fromhttps://theconversation.com/how-should-we-teach-our-kids-to-use-digital-media-67446

School Statistics (2022). Nsukka local government area primary school population. Universal Basic Education Board, Nsukka local government area.

Schwartz, J.R., & Roth, T. (2008). Neurophysiology of sleep and

wakefulness: basic science and clinical implications. *Current Neuropharmacology, 6* (4), 367–78. Doi:10.2174/157015908787386050

Sondergaard, T. F., Andersen, J., & Hjørland, B. (2003). Documents and the communication of scientific and scholarly information: Revising and updating the UNISIST model. *Journal of Documentation, 59* (3), 278. Doi: 10.1108/00220410310472509 S2CID14697793.

Spina, G., Bozzola, E., Ferrara, P., Zamperini, N., Marino, F., Caruso, C., Antilici, L., & Villani, A. (2021). Children and adolescents' perception of media device uses consequences. *International journal of environmental research and public health*, *18*(6), 3048. https://doi.org/10.3390/ijerph18063048

Suni, E. (February 23, 2023). *How to determine poor sleep quality*. Sleep foundation. Retrieved from https://www.sleepfoundation.org/sleep-hygiene/how-to-determine-poor-quality-sleep#.

United Nations International Children Emergency Fund (2007). Handbook for the Convention on the Right of the Child (3rd eds.). http://saruna.mnu.edu.mv/jspui/handle/123456789/9948

Wein, H. (2013). *The benefits of slumber: Why you need a good night's sleep.* National Institute of Health. Retrieved 6th March 2023 from https://newsinhealth.nih.gov/sites/nihNIH/files/2013/April/NIHNiHApr2013.pdf

J. of Family and Society Research 2 (2), December 2023, pp. 21 - 34

Relationship between Family Communication Patterns and Conflict Management Styles of Adolescents in Udenu Local Government Area, Enugu State

Umennuihe, C.L. [1] , Eya, D.N. [1] , *Nwobi, C.A. [1] , & Obiora, J.I. [1]
[1]Department of Home Science and Management,
University of Nigeria, Nsukka

* Correspondence: chibundo.okonkwo@unn.edu.ng

Abstract

This study determined the association between family communication patterns and conflict management styles of adolescents in Udenu Local Government Area, Enugu state. A cross-sectional survey research design was employed. The population comprised 5,238 students in the 16 secondary schools in the study area. A multi-stage sampling procedure was applied to select 360 pupils that served as samples for the study. Three objectives guided the study. The instruments for data collection were two standardized questionnaires and a structured questionnaire that was validated by three lecturers from the Department of Home Science and Management. Data collected were analyzed using descriptive statistics and chi-square. Findings showed that 93.3% of the respondents communicated in a consensual pattern and had high conformity orientation and high conversation orientation within their family. A greater proportion (35.6%) of the respondents expressed a collaborative conflict management style. The respondents agreed that people's beliefs and values with a mean of 3.04, a person's ability or inability to communicate effectively (2.97), and an individual's personality type (2.91), were some factors associated with the conflict management style of adolescents. Factors associated with family communication patterns as identified by the respondents included the religion of family members with a mean of 2.86, parent-child and sibling relationships (2.82), and communication skills of family members (2.78). Family communication pattern was significantly associated with conflict management styles of adolescents at $p < 0.05$ level of significance. The study recommended that a proper family communication pattern should be emphasized as it influences adolescents' conflict management style.

Keywords: Conflict Management, Family Communication, Adolescents, Conversation Orientation, Conformity Orientation

Introduction

Communication is a very important and useful aspect of society and those who are part of said society. Without communication, there would be little advancement in many areas, such as the arts or culture. Communication according to Dyess (2017) simply means to express and relay information, but how communication can be used to

do this differs and takes many forms. From actual verbal communication to sign language, this allows individuals and communities to come together and share ideas, emotions, and sentiments. Communication according to Thakkar and Sheth (2014) refers to the process used by people to create and manage relationships. Communication is one of the processes by which family members work out and share their meanings. Through this interaction, the members define their own identities and their relationships with each other and the rest of the world. Communication shapes and alters the structure of the family system thus, play a crucial role in people's lives (Clark, 2015).

Family is viewed as the simplest unit in life, but the concept of family is complex with different scholars proffering diverging definitions based on structure, roles, responsibilities, relationships, functions etc. According to Anyakoha and Eluwa (2010), the family comprises groups of persons united by ties of marriage, blood or adoption and characterized by common residence and economic cooperation. Every human being is a member of a family, at least in the sense of a biological membership. The family is the most important group which permits parents to provide children with different types of stimulating interactions that equip them for their future responsibilities. Extensive and intensive relationships exist among family members (Anyakoha & Eluwa, 2010). This is because family living includes the sharing of work, play, feeding, rest, joy, cries, worries, and so on through various forms of communication.

Family communication refers to the way verbal and non-verbal information is exchanged between family members. Family communication is much more than just the exchange of words between family members. It has to do with facial expressions, gestures, posture and vocal tones. Family members communicate to exchange ideas, gain knowledge, and increase their understanding of others (Thakkar & Sheth, 2014). Evans (2004) suggests that parents should aim to develop a strong and healthy family communication pattern with their adolescents because it plays a significant role in helping families achieve more flexibility and adapt to changes. According to a 1972 publication by McLeod and Chaffee, family communication happens along two different continuums: concept orientation and socio-orientation. Concept orientation is the pattern of family communication where freedom of expression is encouraged, communication is frequent, and family life is pleasurable. Conversely, socio-orientation is the pattern of family communication where similarity is valued over individuality and self-expression, and harmony is preferred overexpression of personal opinion (Wrench et al., 2023). Concept orientation and socio-orientation were re-conceptualized as conversation orientation and conformity orientation by Ritchie and Fitzpatrick in 1994. Conversation orientation (concept orientation) refers to how much family members are encouraged to engage in

unrestricted conversation; whereas conformity orientation (socio-orientation) refers to how much families believe communication should emphasize similarities in attitudes, beliefs, and values (Smith et al., 2004).

To further explain the concepts of socio and concept orientations, McLeod and Chaffee broke the combinations into four specific categories of communication patterns namely; laissez-faire, protective, pluralistic and consensual (Wrench et al., 2023). Laissez-fair is a style of family communication in which there is no dialogue or uniformity, and families are emotionally estranged from one another. In most cases, children are left to make their own decisions without the involvement of their parents or caretakers. The protective pattern does not include dialogue but does involve conformity, in which parents or caregivers expect their children to follow the rules and do not trust them to make their own judgments. Pluralistic pattern includes discourse but not conformity. When the family unit makes a decision collectively, everyone has an equal opportunity to contribute. Consensual is a family communication pattern characterized by dialogue and conformity, in which family members can openly communicate their opinions and feelings while also appreciating the conformity of the family unit (Cultivate Communication, 2020). Smith et al., (2004) stressed for pluralistic communication pattern since social harmony is maintained when children do not argue with adults or express opinions that are different from those of the family members. *All these play* significant roles in the development of *adolescents.*

According to the World Health Organisation (2017), adolescents are defined as children between the ages of 10 and 19 years. Adolescence is that phase of life when strong parent-child attachment is essential for the normal development of adolescents, biologically, and psychologically, but it can also be a period that is disruptive to family socialization (Day & Padilla-Walker, 2009). Adolescence is a vital period that will determine how a person will view and interact with the world as an adult (Ginny, 2016). Behaviourally, adolescence is associated with volatile emotions and boundary-testing behaviour as individuals explore and assert personal identity, learn to navigate peer relationships, and transition to independence (American Psychological Association, 2017). Adolescence is also a significant period in regards to developing one's communication style, as parent-child communication during this period is believed to influence how an individual resolves conflicts and forms relationships with others in later life (Doyle & Markiewicz, 2005).

Despite the relevance of communication between parents and adolescents globally, there are still myriads of challenges. Observations reveal that parents and adolescents belong to two different generations; parents are often unable to keep pace with changing social and technological developments, so they are unable to understand their adolescent children. At the same time, adolescents cannot

understand the mindset of their parents who they feel have a very traditional mindset and are regarded as "Old School" (Effiong & Usoroh, 2020). This is the period when most parents blame their adolescent children for not listening to parental advice. Interactions with adolescents reveal that they accuse their parents of not taking time to understand them; there is thus an inability of both generations to communicate and understand each other. The incidence of insubordination of adolescents to family norms and leadership as well as parents' lack of control of their wards is alarming (Effiong & Usoroh, 2020). This inability to communicate effectively has been attributed to the escalation of conflict in the family.

Every relationship, even relationships with family members, will eventually have moments of conflict. Although all humans need personal relationships, a person's relationships can have problems and might not go well (Lertsuwan & Hale, 2018). According to Collins and Laursen (2004), conflict frequency and conflict intensity change during adolescence. For example, a meta-analysis showed that conflicts are most frequent during early adolescence and decline gradually thereafter (Mastrotheodoros et al., 2020). Another study showed that the combination of more frequent conflict during early adolescence, more intense conflicts during middle adolescence, and the gradual change into more symmetrical parent–adolescent relationships might be reflected by changes in the way adolescents and their parents handle conflicts with each other during this period (De Goede et al., 2009). To maintain good relationships, conflicts need to be properly managed. However, adolescents might not always react appropriately when faced with a conflict.

Conflict refers to a clash of interests. The basis of conflict may vary but it is always a part of society. The basis of conflict may be personal, racial, political, international or family-related. Since the family is dynamic in nature, conflict in the family can take a wide variety of forms, including verbal, physical, sexual, financial, or psychological. Since conflict is inevitable, importance is now placed on the management of conflict (Afzalur, 2011). Conflict management refers to the process of limiting the negative aspects of conflict while increasing the positive aspects of conflict. It refers to the process by which disputes are resolved, where negative results are minimized and positive results are prioritized (Alper al., 2000). Everyone, including adolescents, has different styles of handling, addressing, resolving and dealing with conflict. According to Thomas and Kilmann's MODE instrument, there are five modes of dealing with conflict along two dimensions of behaviour (assertiveness and cooperativeness). The five modes are: competing (assertive and uncooperative), collaborating (assertive and cooperative), compromising (moderately assertive and cooperative), avoiding (unassertive and uncooperative), and accommodating (unassertive and cooperative) (Howell,

2014). In avoiding style, some adolescents will postpone a deadline or refuse to decide or avoid confrontation and conflict, thereby giving both parties time to modify their attitudes and viewpoints, and the issue may dissolve on its own. The competitive style of conflict management takes a direct approach to dispute resolution, to resolve the disagreement as rapidly as possible. The accommodating approach is the polar opposite of the competitive method, in which the disagreement is resolved by giving in to the other party. In a compromising style, both parties are encouraged to make substantial compromises, this by definition, means that neither party receives everything they seek. The collaborating style aims to discover a solution that meets the needs of all parties concerned (Amaresan, 2022). With properly managed conflict, adolescents together with their family and friends will be able to minimize interpersonal issues and improve relationships (Andreev, 2023).

Adolescent conflict is often a normative extension of conflict in early childhood relationships and a precursor to conflict in early adulthood intimate relationships (Narayan et al., 2014). This implies that adolescents and parents with a history of sensitive, responsive interactions and with high-quality relationships in childhood tend to experience temporary and minor relational difficulties during adolescence, whereas those in relationships of lower quality tend to experience more severe relational difficulties (Branje, 2018). In a study by Hadiwijaya et al (2017), adolescents reported turbulent relationships with parents characterized by low support and high conflict. According to Tucker et al. (2003), adolescents who have more conflicts with their parents have more externalizing and internalizing problems; lower levels of self-esteem, well-being, and adjustment to school; and more frequent substance use. These incidences of conflict among adolescents as opined by Ambhore (2022) could be attributable to poor conflict management skills and negative communication in the family which in the long run could result in psychological and social problems in children as well as parents. This study, therefore, determined whether there is a relationship between how adolescents in Udenu local government area, manage conflicts and the communication patterns practised in their families.

Objectives of the study

The broad objective of the study was to determine the relationship between family communication patterns and conflict management styles of adolescents in Udenu local government area. The specific objectives were to:

1. determine the family communication patterns of adolescents in Udenu local government area;
2. ascertain the conflict management styles of adolescents in the study area; and
3. assess and specify the relationship between family communication patterns and conflict management styles of adolescents.

Methodology

***Study design*:** The study adopted a cross-sectional survey design. A cross-sectional study is a type of observational study that analyzes data from a population, or a representative subset at a specific point in time (Setia, 2016).

***Study population*:** The population for the study comprised 5,238 students in the 16 secondary schools in Udenu Local government area, Enugu State according to the information obtained from the Post-Primary School Management Board (PPSMB) Obollo zone (2022).

***Sample size selection procedure*:** The WHO (2013) guideline for the calculation of sample size in a survey was used to obtain the sample size of 358 respondents. Multi-stage sampling technique was adopted in selecting the respondents for this research. In stage one, forty per cent (40%) of the 16 secondary schools were calculated giving a total of six schools. The six schools were selected from the list of schools using circular systematic random sampling. This is done by selecting every third school on the list. In the second stage, proportionate sampling was used to determine the sample size for each selected school. In the third stage, simple random sampling without replacement was used to select students for the study to give everyone an equal chance of being recruited. A five per cent (5%) increase in sample size was added to bring the sample size up to 376. The 376 students gave their consent and participated in the study.

***Instrument for data collection*:** Data were collected using a structured questionnaire and two standardized questionnaires. The first standardized questionnaire called the Revised Family Communication Pattern (RFCP) Instrument was used to measure adolescents' family communication patterns. The RFCP consists of 26 items measuring two underlying dimensions of family communication patterns: Conversation orientation (15 items) and Conformity orientation (11 items). The responses are given on a 4-point scale from disagree (1) to strongly agree (4). Using the scale scores, family communication types were categorized as having a high or low conversation and conformity orientation. The second standardized questionnaire, Conflict Style Questionnaire (CSQ) is a 25-item questionnaire that measures avoidance, competition, compromise, accommodation and collaborative management style. Responses were on a five-point Likert scale from never (1), to always (5). The instrument was to assess the respondents to determine their more dominant and less dominant conflict styles. The structured questionnaire was used to elicit information on the demographic and socio-economic characteristics of the respondents.

***Validity and reliability*:** The questionnaires were face and content validated by three lecturers in the Department of Home Science and Management, University of Nigeria, Nsukka. Their corrections and their suggestions were considered in producing the final instrument. Cronbach's alpha correlation coefficient of 0.79 was obtained from testing the instrument on 20 students in

Nsukka local government area. This shows a fairly good internal consistency of the test items.

***Method of data collection*:** The questionnaires were administered to the respondents by the researchers with the help of two trained research assistants. The questionnaires were distributed to the students by hand. Then the researchers and assistants returned on another day to collect them. Out of the 376 that were distributed, only 360 were returned. This gave a 96% return rate.

***Data and statistical analysis*:** The participants' scores on the sub-scales of the RFCP instrument were summed to obtain a composite score for conversation and conformity orientations. The total obtainable scores for conversation orientation ranged from 1-60 and 1-44 for conformity orientation. Participants with a total score range of 1-30 on the conversation orientation were categorized as having low conversation orientation while scores from 31-60 reflected high conversation. For conformity orientation, a total score of 1-21 was categorized as low conformity and 22-44 indicated high conformity. These scores were then used to categorize respondents into different types of family communication patterns as follows. Participants who scored low on conformity and conversation were categorized as laissez-faire pattern; those with low scores on conversation and high scores on conformity were classified as protective pattern; those who scored high on conversation and low on conformity were grouped as pluralistic pattern; and those who scored high on conformity and conversation were categorized as consensual communication pattern.

The data obtained was coded into the computer program Statistical Product and Service Solution (SPSS, version 23.0). Descriptive statistics such as frequencies, percentages, means and standard deviation were used for data analysis. The chi-square test was used to determine the relationship between categorical variables. A p-value < 0.05 was considered significant.

Results

Socio-economic/demographic characteristics of the respondents

The demographic characteristics of the respondents showed that there are 63.1% of females and 36.9% of males in the population. The majority (60.6%) of the respondents were aged between 14-17 years. A greater proportion (96.4%) of the respondents practice the Christian religion and 98.9% of them belong to the Igbo ethnic group. More than half (51.7%) of the respondents' fathers were secondary school graduates while 7.8% of them had no formal education. More than a third (48.6%) of the respondents' mothers were secondary school graduates while 5.8% had no formal education. Trading was the major occupation for the respondents' parents (38.1% Fathers and 61.9% Mothers). A greater proportion (43.3%) of respondents had a household monthly income of less than ₦20,000 and 48.6% of them had a household size of 5-8 persons.

Family communication patterns

Table 1 shows the family communication patterns of participants. From the table, the majority (93.3%) of the respondents had a consensual family communication pattern followed by a pluralistic family communication pattern (3.1%), a protective family communication pattern (2.2%) and a laissez-faire family communication pattern (1.4%).

Table 1: Family communication patterns of adolescents

Family communication pattern	Frequency	Percentage
Laissez-faire	5	1.4
Protective	8	2.2
Pluralistic	11	3.1
Consensual	336	93.3
Total	**360**	**100.0**

Conflict management styles

Table 2 shows the conflict management styles of the participants. More than a third (35.6%) of the respondents had a collaborative conflict management style, 32.8% had the avoidance style, 14.7% had the accommodation style, 9.2% had the compromise style and 7.8% had the competitive conflict management style.

Table 2: Conflict management styles of adolescents

Conflict management style	Frequency	Percentage
Avoidance	118	32.8
Competition	28	7.8
Compromise	33	9.2
Accommodation	53	14.7
Collaboration	128	35.6
Total	**360**	**100.0**

Relationship between family communication pattern and conflict management style

Table 5 shows the relationship between family communication patterns and the conflict management styles of the respondents. At $p < 0.05$ level of significance, there was a significant relationship between family communication patterns and the conflict management style of adolescents in the study area. Adolescents with avoidance conflict management style were mostly (62.5%) from families with protective communication patterns. The majority (81.1% and 80.0%) of respondents with collaboration resolution styles belonged to families with pluralistic and laissez-faire communication patterns respectively.

Table 5: Relationship between family communication patterns and conflict resolution styles of the respondents

Variables	AvoidanceF (%)	CompetitionF (%)	CompromiseF (%)	AccommodationF (%)	CollaborationF (%)	Total
Laissez-faire	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)	4 (80.0)	5 (100.0)
Protective	5 (62.5)	1 (12.5)	11 (12.5)	0 (0.0)	11 (12.5)	8 (100.0)
Pluralistic	1 (9.1)	1 (9.1)	0 (0.0)	0 (0.0)	9 (81.1)	11 (100.0)
Consensual	112(33.3)	25 (7.4)	32 (9.5)	53 (15.8)	114 (33.9))	336 (100.0)
					$\chi^2 = 23.214$, df = 12, p = 0.026*	

χ^2 = Chi-square value; p = Level of significance; df = degree of freedom; *Correlation is significant at $p<0.05$

Discussion

Communication within the family is extremely important because it enables members to express their needs, wants, and concerns to each other, especially when it is open and honest. The finding of this study showed that the majority of the respondents had consensual (high conversation and high conformity) family communication patterns in their households. This suggests that while family members are allowed to openly express their thoughts, feelings, and activities, parents are the final decision-makers about important issues. According to Cuncic (2023), tensions arise as a result of these two seemingly opposing tendencies, which are motivated by a desire to be open while maintaining control. The resultant effect is that although children come to value family interactions, they are however more likely to agree with their parents' beliefs and values (Lock, 2023). Consensual families also attempt to avoid conflict since it undermines the hierarchical system in which the parents make decisions for the family and the authority they wield (Cuncic, 2023). Supporting this finding, the result of a study by Libertsuwan and Hale (2018) showed that a greater proportion of participants have a consensual style of communication in their families. The findings of the current study also showed that few respondents had protective, pluralistic and laissez-faire communication patterns in their families. Children in protective households are taught not to publicly argue with their parents or engage in conversations where there may be conflicts of opinion. The mutuality of respect and shared interests that promote both competence and communication are emphasized in a pluralistic communication system. Children in laissez-faire families are likely to be influenced by external factors like the media and peers because there is little parent-child interaction (Wrench et al., 2023). Supporting these findings, McLeod et al. (2002) identified laissez-faire, protective, pluralistic and consensual patterns as the four basic types of family communication patterns.

Since conflict is inevitable, importance is now placed on the management of conflict (Afzalur, 2011). Conflict management refers to the process by which disputes are resolved, where negative results are minimized and positive results are prioritized (Alper et al., 2000). The finding of this study showed that a greater percentage of the adolescents were high conflict managers as they mostly opted for collaborative or avoidance means to resolve conflicts. This implies that while most adolescents seek a win-win solution to conflict situations that leaves everybody satisfied, another percentage aims to reduce conflict by ignoring it, removing the conflicted parties, or evading it in some manner (Andreev, 2023). Supporting this finding, studies by Lertsuwan and Hale (2018), Howell (2014) and Mboya et al. (2016) showed that a collaborative conflict resolution style was preferred

by the participants. According to Herrity (2022), a collaboration conflict management style is important, when several people are impacted by the resolution; when it involves an important relationship; and when the interests of all involved parties need to be considered. Similarly, a study by Drakulevski et al. (2020) also showed that the second preferred conflict management style is avoidance, which can result in negative feelings, additional problems, and unresolved situations, as well as a further delay of confrontations. Findings of this study that showed competition style as the lowest preferred resolution method corroborates that of Drakulevski et al. (2020) in which the competing style was rarely used by the participants. A competing style is a win-lose approach that relies on an aggressive style of communication, low regard for future relationships and coercive power.

In families with high conformity (protective and consensual), parents tend to avoid conflicts and disputes to preserve harmony and connectedness within the family, resulting in children who are unskilled communicators during conflict situations. On the other hand, high-conversation families allow children to express their opinions and engage in family discussions, resulting in children with communication skills that allow them to accept the opinions of others and defend their ideas (Lertsuwan & Hale, 2018). Findings showed that the protective communication pattern (high conformity) was associated with avoidance management style while the pluralistic pattern (high conversation) was associated with collaboration conflict resolution style. This suggests that during conflict situations, adolescents from families that encourage dialogue look for solutions that will satisfy both parties while those from families that emphasize conformance to family beliefs tend to ignore or withdraw themselves from conflict situations. Supporting this finding, a study by Dumalo and Botta (2000) showed that being in a protective family predicted avoiding style of conflict management while participants from pluralistic families recorded higher collaborating style. Similarly, a survey by Lertsuwan and Hale (2018), showed that respondents who reported protective communication patterns scored higher on the avoiding conflict management style compared to other groups. In this study, the Laissez-faire communication pattern was also associated with a collaborative management style. The implication is that families that do not engage each other and allow children to make their own decisions are likely to produce adolescents who strive for a win-win solution during conflicts. In contrast, the result of a study by Dumalo and Botta (2000) reported that participants with a laissez-faire pattern had lower collaborating conflict management styles. The finding further showed that consensual communication pattern was associated with collaboration and avoidance of conflict management styles. In other words, families that value conversation and enforce adherence to family values are likely to produce children who either avoid conflict or cooperate with

conflicting parties to find a solution. This finding corroborates that of Lertsuwan and Hale (2018) which showed that participants with consensual patterns scored higher on collaborating and avoiding styles. Dumalo and Botta (2000) also reported that individuals from consensual homes had higher collaborating conflict resolution styles. Adolescents in consensual families are open and free to discuss with their parents, and parents also expect agreement from their children. This result suggests that when conflict arises, adolescents in the study vary in the conflict styles that they employ in response to the situation.

Conclusion

This study showed the relationship between family communication patterns and conflict management styles of adolescents in Udenu local government area, Enugu State, Nigeria. A consensual pattern of communication, characterized by high conversation and high conformity, was mostly practised by adolescents. They also usually engaged in the collaboration and avoidance styles of conflict resolution. The pattern of communication within their families was associated with the various conflict management styles adopted by adolescents. Adolescents whose families practised protective patterns of communication patterns were likely to handle conflict by avoiding confrontations while those who practised the pluralistic pattern of communication showed more tendency for a more collaborative way of conflict resolution. The uninvolved or laissez-faire communication pattern also correlated with the collaboration style while the consensual pattern was associated with both collaboration and avoidance conflict management styles. This study, therefore, concludes that family communication environments encourage the creation of a relational framework that young people employ to manage conflicts in their relationships with other people.

Recommendations

The following recommendations were made based on the findings of the study.

1. The government and primary school administrators should liaise and implement policies that will educate students and parents on the proper family communication patterns as well as better conflict management styles for adolescents to be better citizens in society.
2. Parents and pupils should be adequately informed of the benefits of a proper family communication pattern.
3. There should be further studies to examine the association between family communication patterns and conflict management styles of other members of the family.

References

Afzalur, R. (2011, October 25). *Managing conflicts in organizations*. Taylor & Francis. Retrieved from https://www.taylorfrancis.com/books/mono/10.4324/9780203786482/managing-conflict-organizations-afzalur-rahim

Alper, S., Tjosvold, D., & Law, K. S. (2000). Conflict management, efficacy, and performance in organizational teams. *Personnel Psychology*, *53* (3), 625–642. https://psycnet.apa.org/doi/10.1111/j.1744-6570.2000.tb00216.x

Amaresan, S. (2022). *Expert tips for conflict management for every personality type.* Hubspot. Retrieved 3rd March 2023 fromhttps://blog.hubspot.com/service/conflict-management-styles#:~:text=The%205%20Conflict%20Management%20Styles,compromising%2C%20collaborating%2C%20and%20competing.

Ambhore A. M., Ashtaputre A.A., Puri P.A., Bhutekar S.V., Bochare B. R., Sheikh M. R., Talware S. L., & Taur A. D. (2022). Communication problem and conflicts in parent child relationship. *Indian Journal of Social Sciences and Literature Studies, 8*(1), 250-253. ISSN 2349-5634 (Print) ISSN 2455-0973 (online) https://www.researchgate.net/publication/360132450_Communication_Problem_and_Conflicts_in_Parent_Child_Relationship

American Psychological Association (2017, February 23). *Adolescent behaviour.* APA. https://www.apa.org/pubs/highlights/peeps/issue-88

Andreev, I. (2023, April 18). *Conflict management styles.* Valamis. Retrieved from https://www.valamis.com/hub/conflict-management-styles

Anyakoha, E. U., & Eluwa, M. (2010). *Home management for schools and colleges.* Abuja, Nigeria: Nigerian African First Publishers PLC.

Branje, S.J.T. (2018). Development of parent–adolescent relationships: Conflict interactions as a mechanism of change. *Child Development Perspectives, 12*(3), 171-176. https://doi.org/10.1111/cdep.12278

Clark, A. M. (2015). Family Communication patterns and adolescent emotional well-being: Cross classification of mother-child and father-child interactions. *Communication Theory, 12*(1), 70-91. https://ir.library.oregonstate.edu/downloads/ht24wm98h

Collins, W., & Laursen, B. (2004). Parent-child communication during adolescence. In A. L. Vangelisti (Eds.), *Handbook of family communication* (pp. 333–348). Erlbaum. https://www.researchgate.net/publication/256444591_Parent-child_communication_during_adolescence

Cultivate Communication (2020, January 28). *Cultivate communication by understanding the family communication patterns theory.* OKPTA Cultivate. Retrieved from https://okptacultivate.com/2020/01/28/cultivate-communication-by-understanding-the-family-communication-patterns-theory/

Cuncic, A. (2023). *Types of communication patterns in families.* Our everyday life. Retrieved 12th June 2023 from https://oureverydaylife.com/types-communication-patterns-families-7948054.html

Day, R. D., & Padilla-Walker, L. M. (2009). Mother and father connectedness and involvement during early adolescence. *Journal of Family Psychology (JFP): Journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, *23*(6), 900–904. https://doi.org/10.1037/a0016438

De Goede, I.H.A., Branje, S.J.T., & Meeus, W.H.J. (2009). Developmental changes in adolescents: Perceptions of relationships with their parents. *Journal of Youth Adolescence, 38*(1), 75–88. https://doi.org/10.1007/s10964-008-9286-7

Doyle, A. B., & Markiewicz, D. (2005). Parenting, marital conflict and adjustment from early- to mid-

adolescence: Mediated by adolescent attachment style. *Journal of Youth and Adolescence, 34*(2), 97–110. https://doi.org/10.1007/s10964-005-3209-7

Drakulevski, L., Nakov, L., & Taneva-Vashoska, A. (2020). Conflict management styles among managers in Macedonian organizations. *Journal of Corporate Governance, Insurance and Risk Management (JCGIRM), 1*(1), 146-156. https://core.ac.uk/download/pdf/362207132.pdf

Dumalo, R., & Botta, R.A. (2000). Family communication patterns and the conflict styles young adults use with their fathers. *Communication Quarterly, 48*(2), 174-189. https://doi.org/10.1080/01463370009385589https://www.researchgate.net/publication/254254391_Family_communication_patterns_and_the_conflict_styles_young_adults_use_with_their_fathers

Dyess P. (2017). *Family communication pattern and power theory*. Digital commons. Retrieved 1st June, 2023 from https://digitalcommons.murraystate.edu/cgi/viewcontent.cgi?article=1111&context=bis437#:~:text=Family%20communication%20pattern%20(FCP)%20assumes,specialized%20structure%20within%20the%20family

Effiong, N.A., & Usoroh, C. (2020). Family communication patterns and cohesion between adolescents and parents in Uyo local government area of Akwa-Ibom state Nigeria. *Sapientia Foundation Journal of Education, Sciences and Gender Studies (SFJESGS),2*(4), 141-153. https://www.sfjesgs.com/index.php/SFJESGS/article/view/110

Evans, R. (2004). *Family matters: how schools can cope with crisis in childrearing*. San Francisco: Jossey-Bass, Routledge

Ginny, R. (2016, July 2). *Adolescence an important time change*. University of Iowa Hospitals and Clinics. Retrieved from https://uihc.org/health-topics/adolescence-important-time-change

Hadiwijaya, H., Klimstra, T.A., Vermunt, J.K., Branje, S.J.T., & Meeus, W.H.J. (2017). On the development of harmony, turbulence, and independence in parent–adolescent relationships: A five-wave longitudinal study. *Journal of Youth and Adolescence, 46*(8), 1772–1788. https://doi.org/10.1007/s10964-016-0627-7

Herrity J. (2022). *5 Major conflict management styles for successful managers.* Indeed. Retrieved from https://www.indeed.com/career-advice/career-development/conflict-management

Howell S. E. (2014). Conflict management: A literature review and study. *Radiology management*, *36*(5), 14–20. https://www.ahra.org/ AM/ Downloads/OI/qc/RM365_p14-23_Features.pdf

Lertsuwan, B., & Hale, C. (2018). Family communication patterns and conflict management styles young adults use with their parent in Chiang Mai Thailand. *Veridian E-journal*, *11*(5), 582-599. https://he02.tci-thaijo.org/index.php/Veridian-E-Journal/article/download/166441/141876/625677

Lock, C. (2023). *How do the 4 types of communication patterns in families affect my own relationships?* Rumie. Retrieved 12th June, 2023 from https://learn.rumie.org/jR/bytes/how-do-the-4-types-of-communication-patterns-in-families-affect-my-own-relationships/

Mastrotheodoros, S., Van der Graaff, J., Deković, M., Meeus, W. H. J., & Branje, S. (2020). Parent-adolescent conflict across adolescence: Trajectories of informant discrepancies and associations with personality types. *Journal of youth and*

adolescence, *49*(1), 119–135. https://doi.org/10.1007/s10964-019-01054-7

Mboya, A.A., Kiplagat, P., & Ernest, Y. (2016). Collaboration conflict management strategy: A solution to secondary schools' unrests in Kenya. *International Journal of Trend in Research and Development, 3* (6), 203-207. ISSN: 2394-9333. http://www.ijtrd.com/papers/IJTRD4357.pdf

McLeod, J.M., Atkin, O.K., & Chaffee, S.H. (2002). Adolescents, parents, and television use: Self-report and other report measures from the Wisconsin sample. In G.A. Comstock & E.A. Rubinstein (Eds.), *Television and social behavior: Volume 3. Television and adolescent aggressiveness* (pp. 239-313). Washington, DS: U.S. Government Printing Office.

Narayan, A. J., Englund, M. M., Carlson, E. A., & Egeland, B. (2014). Adolescent conflict as a developmental process in the prospective pathway from exposure to inter-parental violence to dating violence. *Journal of Abnormal Child Psychology*, *42*(2), 239–250. https://doi.org/10.1007/s10802-013-9782-4

Post-Primary School Management Board – PPSMB (2022). Government secondary schools in Udenu local government area. PPSMB, Obollo zone.

Setia M. S. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology, 61*(3), 261–264. https://doi.org/10.4103/0019-5154.182410

Smith, K. M., Taylor, S., Hill, B., & Zabriskie, R. B. (2004). Family functioning and leisure in single-parent families. Abstracts from the 2004 Leisure Research Symposium. Ashburn, VA: National Recreation and Parks Association.

Thakkar, V. & Sheth, N. (2014). Patterns between adolescents and their parents. *Journal of communication*, *2*(1), 565 – 572. https://www.academia.edu/74931029/Patterns_between_Adolescents_and_their_Parents

Tucker, C.J., McHale, S.M., & Crouter, A.C. (2004). Dimensions of mothers' and fathers' differential treatment of siblings: Links with adolescents' sex-typed personal qualities. *Family Relations, Interdisciplinary Journal of Applied Family Science, 52*(1), 82-89. https://doi.org/10.1111/j.1741-3729.2003.00082.x

Wrench, J.S., Punyanunt-Carter, N.M., & Thweatt, K.S. (2020). *Interpersonal communication - A mindful approach to relationships.* New York: SUNY Oswego. https://socialsci.libretexts.org/Bookshelves/Communication/Interpersonal_Communication/Interpersonal_Communication_-_A_Mindful_Approach_to_Relationships_(Wrench_et_al.)/11%3A_Family_and_Marriage_Relationships/11.01%3A_Family_Relationships

World Health Organisation (2017). *Adolescent health.* WHO. Retrieved from https://www.who.int/health-topics/adolescent-health#tab=tab_1

J. of Family and Society Research 2 (2), December 2023, pp. 35 - 46

Perceived Influence of Hostel Sanitation Practices on Students' Health at the University of Nigeria, Nsukka

Nwadi, C.L.[1]; Attah, B.I.[1]; Ugwu, E.I.[1]; Nwakpadolu, G.M.[2]; & Ezekoye, R.O.[1]
[1]Department of Home Economics and Hospitality Management Education, University of Nigeria, Nsukka
[2]Micheal Okpara University of Agriculture, Umudike

Correspondence: ijeoma.attah@unn.edu.ng

Abstract

This study investigated the perceived influence of hostel sanitary practices on students' health at the University of Nigeria, Nsukka. Three objectives guided the study. The study design was a cross-sectional survey. The population for the study was the 7129 assigned occupants of the 16 hostels in UNN out of which 160 respondents were randomly selected. A structured questionnaire was used for the data collection and the data were analyzed using means and standard deviations. The findings showed that the causes of poor hostel sanitary practices were water scarcity (mean=3.58), lack of hygiene instruction (mean=3.13) and lack of garbage containers for disposing of waste (mean=3.8). The findings also showed that strategies/measures to improve sanitation include: controlling overcrowding of students in each room (mean 3.56). The university authorities should provide waste disposal cans (mean= 3.07) and hygiene instructions (mean=3.56) should be provided for students. Also, the study found that the perceived health implications of poor sanitary practices were food poisoning (mean=3.50), depression (mean=3.8), diarrhoea (mean=3.28), cholera (3.59), and skin irritation(mean=3.50). The recommendations are that wash-related materials and agents should be regularly supplied to ensure quality cleaning services, also toilet cleaning checklist be introduced to ensure quality cleaning services by cleaning professionals, low-cost menstrual hygiene-related disposal materials placed in existing buildings in female hostels and there should be a participation of students in environmental sanitation.

Keywords: Influence, Hostel, Sanitation practices, Students, Health.

Introduction

Sanitation is associated with man's existence and it is an essential part of living. Sanitation when carried out very well promotes hygiene, prevents any form of diseases and infections that occur due to a dirty environment, and leads to a healthy lifestyle. Students' hygiene depends largely on the sanitary conditions of their environment which will prevent diseases (Uchegbu, 2000; WHO 2020). A student is a person enrolled in a school, college, university, or otherwise under the supervision of an educational activity and seeks

instruction from teachers (Garner 2019). Male and female undergraduate students of universities are usually between the ages of 18 and 27; an age bracket often referred to as the age of "emerging adulthood"(Arnett, 2000). During this time the development of self-identity, changing support systems, and the shifting of interpersonal influences occur and set this life stage apart from adolescence and adulthood (Nelson et al., 2008). It is a period young people begin to develop lifelong views and behaviours. Many individuals in this category are undergraduate students who live in hostels. There is a need for these students to adopt proper sanitation practices in the hostels to ensure healthy living.

A hostel is a lower-priced inn of sorts that offers basic, shared accommodations. Typically, a hostel features a large room with separate beds, a shared bathroom, and a communal kitchen. Some hostels have private rooms, but the lower-cost ones generally offer bunk beds. Hostels originated in Europe, but have grown in popularity and are found all over the world(Forever, 2022). A hostel is a place where economical, healthy and safe accommodation is supposed to be provided for the students of a school or college (Uddin, 2019). However, living conditions in most hostels are far less comfortable than that at home. Lack of hygiene education, overcrowding, poor supervision and so on may cause poor hostel sanitation. The unhygienic living conditions may also cause a lot of students to have health problems like indigestion (Uddin, 2019). Hygiene is the practice of keeping oneself and surroundings clean to prevent infection, and disease and remain healthy and fit. Students who stay in hostels are more likely to practice good hygiene because there are more people around to transfer germs and a wider range of diseases which are perceived influences of poor sanitation practices.

Students and school authorities can contribute towards maintaining good hygiene and sanitation by playing their roles efficiently. For students to be comfortable and live healthily they should make adequate use of every sanitation facility provided by school authorities and ensure that where they live in the hostel is always kept clean (Uttaranchal, 2022). However, poor hostel sanitation practices at the University of Nigeria Nsukka have been observed by the researcher. The waste disposal system was very poor, resulting in students providing themselves with personal and portable garbage bins for disposing of their waste. Most students also use personal portable buckets to ease themselves rather than make use of the unsanitary toilet facilities in the hostels. These practices could lead to the easy spread of infectious diseases among students. This concern has motivated this study on the perceived influence of hostel sanitation practices on students' health at the University of Nigeria Nsukka.

Purpose of the study: The main purpose of the study was to investigate the Influence of Hostel Sanitation Practices on Students' Health at the University of Nigeria. Specifically, the study determined the:

1. causes of poor sanitation practices in students' hostels;
2. perceived influence of poor sanitation practices on the health of the students and
3. measures and plans by students a school authorities to improve ho sanitation practices.

Methodology

Study design: The study adopted a survey research design. This design according to Nworgu and Yager (2006) is one in which a group of people is studied by collecting and analyzing data from only a few people considered to be representatives of the entire group. This design was chosen because it is ideal for getting the needed responses on the perceived influence of hostel sanitation practices on students' health at the University of Nigeria Nsukka.

***Study population*:** The population for the study consisted of all the 2,129 male and female students in the 16 hostels at the University of Nigeria Nsukka campus. This population was obtained based on the number of bed spaces in the hostels.

Sample size selection procedure: To determine the sample for the study, the Taro Yamane formula**;** n = N/ 1+ N(e)2 was used where;

n = sample size
N = population size,
e = precision or sampling error (0.05)

This gave a sample size of 337 students who were then selected using simple random selection without replacement.

Instrument for data collection: The instrument for data collection was a structured questionnaire titled "Influence of Hostel Sanitation Practices on Students' Health". The questionnaire was structured into section A-C which sought information on the three objectives of the study. Section A obtained data on the causes of poor hostel sanitation practices. Section B contained items on the perceived influence of hostel sanitation practices on students' health. Section C was used to identify measures and plans to improve the sanitation practices of students.

Validation and reliability: The questionnaire was face-validated by three experts, two from the Department of Home Economics and Hospitality Management Education and one from the Student Affairs Department of the University of Nigeria Nsukka. They made careful judgments of the questionnaire and ascertained that the content of the instrument covered the objectives of the study. Their criticism and suggestions were used to produce the final version of the instrument.

Method of data collection: The researchers administered 337 copies of questionnaires to the respondents. The instrument was administered to each respondent through contact by hand distribution. All the copies were completed, collected back on the spot and used for analysis.

Data and statistical analysis:The data collected from the respondents were analyzed manually using the mean. The mean is represented by the formula $\mu = \Sigma fx / n$ where μ= mean

X= nominal value to the scale point. F = the number of respondents for each response category.N= the total number of respondents in the item questions. Σ= sum of fx. The nominal values assigned to the different scales were as follows: SA = 4, A = 3, D = 2, SD = 1 Total = 10. Using the formula μ = 10/4 =2.5, the decision rule was that any mean response of 2.5 and above would be accepted, while the item mean score below 2.5 was not accepted.

Results

Demographic characteristics of the respondents

The respondents were made up of 59.3% female and 40.7% male students within the age range of 18 to 30 years.

Causes of poor sanitation practices

Table 1 shows the perceived causes of poor hostel sanitation practices at the University of Nigeria Nsukka. Data showed that the causes of poor hygiene practices included overcrowding (mean = 4.19), water scarcity (mean = 3.58), indiscriminate dumping of refuse (mean = 3.56), poor supervision of employed cleaners (mean = 3.25), lack of hygiene education (mean = 3.13) and insufficient waste bins for disposing of wastes (mean = 3.00). The item "inadequate funds to provide sanitation equipment and facilities" was not accepted as a cause of poor hygiene practices (mean < 2.50).

Table 1: Mean responses on the causes of poor hostel sanitation practices

Item Statement	SA	A	D	SD	Sum	Mean	Decision
Water scarcity	100	53	7	0	573	3.58	**Agreed**
Lack of hygiene education	60	70	20	10	500	3.13	**Agreed**
Insufficient waste bins for disposing of waste	50	80	10	20	480	3.00	**Agreed**
Inadequate funds to provide sanitation equipment and facilities.	20	40	50	50	350	2.19	**Disagreed**
Indiscriminate dumping of refuse on the hostel premises	90	70	0	0	570	3.56	**Agreed**
Overcrowding	60	50	30	20	670	4.19	**Agreed**
Poor supervision of employed cleaners	70	60	30	0	520	3.25	**Agreed**

N=337, , A= agree, D= disagree, SD = strongly disagree,

Table 2 shows the perceived influence of poor hostel sanitation practices on the health of students. They include; food poisoning (mean = 3.56), depression (mean =3.18), diarrhoea (mean =3.28), cholera (mean =3.59), and skin irritation (mean =3.50). The respondents did not agree that headaches, fatigue and allergies were related to poor sanitation practices (2.47).

Table 2: Mean responses on the perceived influence of poor hostel sanitation practices on the health of students.

Item Statement	SA	A	D	SD	Sum	Mean	Decision
Food poisoning due to unwashed plates, cutleries and pots.	63	90	20	7	569	3.56	Agreed
Depression or anxiety symptoms if not taken care of properly	74	66	7	0	508	3.18	Agreed
Diarrhoeal	64	81	10	5	524	3.28	Agreed
Skin irritations	76	82	4	2	560	3.50	Agreed
Headaches, fatigue and allergies	35	46	38	41	395	2.47	Disagreed
Cholera	91	69	0	0	574	3.59	Agreed

N=377, A= agree, D= disagree, SD = strongly disagree,

Table 3 shows measures that could be taken by students to improve hostel sanitation practices. Data showed that the measures include; garbage management(mean=3.30), promoting good hygiene habits through education (mean = 2.93), proper washing of hands (mean =3.34), proper cleaning of rooms and corridors (mean =3.53), making demands for sanitation services(mean =3.08), making good use of waste bins(mean. =3.66), spraying of insecticides and fungicides to reduce the spread of disease and infection-causing agents(mean =3.29), proper use of facilities provided by the school authorities(mean =3.38). All these means were above the cut-off point of 2.50 and the item "making good use of waste bins' was considered the most important strategy.

Table 3: Mean responses on measures and plans that could be taken by students to improve hostel sanitation practices

Item Statement	SA	A	D	SD	Sum	Mean	Decision
By garbage management	78	62	10	10	528	3.30	**Agreed**
Promoting good hygiene habits through education	43	77	26	14	469	2.93	**Agreed**
Proper washing of hands with soap and water after visiting the toilet	69	81	6	4	535	3.34	**Agreed**
Proper cleaning of the rooms, corridors &surroundings	84	76	0	0	564	3.53	**Agreed**
Making demands for sanitation services.	62	58	30	10	492	3.08	**Agreed**
Making good use of the waste bins for disposing of waste properly	76	94	0	0	586	3.66	**Agreed**
Spraying of insecticides and fungicides to reduce the spread of disease and infection-causing agents.	64	83	8	5	526	3.29	**Agreed**
Proper use of facilities provided by the school authorities	80	60	20	0	540	3.38	**Agreed**

N=337, X= mean, A= agree, D= disagree, SD = strongly disagree,

Table 4 shows measures that could be taken by school authorities to improve hostel sanitation practices. Data showed that the measures that could be taken by school authorities to improve hostel sanitation practices include: promoting good hygiene through extensive education (mean =3.56) provision of enough waste bins all over the halls of residence (mean = 3.07) controlling the overcrowding of students snd facilities (mean =- 3.56) and proper supervision of employed cleaners (mean = 3.25), were above the cut-off mark of 2.50 and were termed as agreed. While the provision of sufficient toilets and latrine facilities (mean =1.98) ensuring constant water supply in the hostel (mean = 2.41), the provision of adequate well-functioning toilets and latrine systems (mean = 1.18), and provision of funds for sanitation equipment and facilities (mean = 2.19), were below the cut-off point of 2.50 and were termed as disagreed.

Table 4: Mean responses on the Measures and plans by School Authorities to improve hostel sanitation practices

Item Statement	SA	A	D	SD	Sum	Mean	Decision
Promoting good hygiene through extensive education	90	70	0	0	570	3.56	Agreed
Provision of enough waste bins all over the halls of residence	57	61	38	4	491	3.07	Agreed
Provision of sufficient toilets and latrine facilities	23	14	52	71	309	1.93	Disagreed
Ensuring constant water supply in the hostel	47	10	64	39	385	2.41	Disagreed
Provision of adequate well-functioning toilets and latrine systems	10	29	41	80	189	1.18	Disagreed
Provision of funds for sanitation equipment and facilities	20	40	50	50	350	2.19	Disagreed
Controlling the overcrowding of students in each room	90	70	0	0	570	3.56	Agreed
Proper supervision of employed cleaners	70	60	30	0	520	3.25	Agreed

N=337, X= mean, A= agree, D= disagree, SD = strongly disagree,

Discussion

The finding of this study revealed that the perceived causes of poor hostel sanitation practices included water scarcity, lack of hygiene education, not enough waste bins and overcrowding. Water scarcity may be defined as a lack of safe water supplies. As the population of the world grows and the environment becomes further affected by climatic change, access to safe water dwindles. According to Hutton (2017), an estimated 502.000 deaths are associated with scarcity of water. Lack of access to adequate water supply in students' hostels leads to poor sanitation and hygiene services. For instance, the water closet toilets might not be properly cleaned after use, the practice of handwashing might not be

regularly observed, and the sewage systems might even fail to function. These unhygienic conditions consequently could lead to increased risks of diarrhoea, skin infections and other communicable diseases.

Poor hygiene education could also lead to poor sanitation. The biggest cause of poor sanitation globally is simple lack of education, for example, the simple act of washing hands regularly, can have a huge impact on the overall health of a community (Abanyie2022). The problem of personal hygiene could lead to hygiene-related diseases like diarrhoea, body lice, hair lice and so on. Globally, the high mortality and morbidity due to communicable diseases among students have been attributed to neglect of personal hygiene. Students need to be taught and be educated by lecturers and hostel administrators to be able to adopt certain behaviours as regards their health and well-being, thus poor hygiene education might lead to poor sanitation.

Inadequate waste disposal caused by insufficient wastebins in hostels drives the infection circle of many bacteria and other germs that can spread through contamination and may lead to poor sanitation. Poor waste management ranging from an inadequate collection system to ineffective disposal by students causes water and environmental pollution leading to poor sanitation in the hostels (Hutton, 2017). Furthermore, overcrowding occurs when a species population exceeds the carrying capacity and may result in poor ventilation. Specifically, overcrowding leads to poor sanitation by increasing the risk of infection as the number of potential transmitters is increased. Overcrowding may lead to close-contact infectious diseases such as gastroenteritis and diarrhoea diseases. These findings were in agreement with Musa and Haque (2016) who found similar factors causing poor sanitation practices in student hostels. Mangrio and Zdravkovic (2018) also found that overcrowding could be associated with poor mental health.

The finding of the study revealed the perceived influence of poor sanitation practices on the health of students. According to the respondents, poor sanitation practices can negatively affect students' health in such ways as food poisoning from dirty dishes, cutlery, and pots; undiagnosed depression or anxiety symptoms and skin irritations. The hostel should constantly be kept clean and organized to minimize these influences. Nwobi (2022) revealed that adequate hostel sanitation practices of undergraduates contribute greatly to improved health status in the university. The finding was also similar to Mara et al. (2010) who revealed that most people die from diarrhoea diseases, especially children. The author stated that diseases are often caused when germs get into drinking water or unkept foods as a result of poor sanitation practices. Poor sanitation is characterized by poor solid waste disposal techniques and inadequate sanitation facilities. This is associated with perceived diseases such as food poisoning, depression, diarrhoea, skin, irritation, cholera, typhoid, malaria and dysentery.

Therefore, there is a need to encourage the public especially students to participate in the proper handling of waste and hygiene standards.

The result of this study was also similar to the studies of Ogbonna et al. (2007) and Uganda (2022) which were in agreement with the findings on the perceived health effect of poor sanitation. With the advent of COVID-19, Poague et al. (2022) and other researchers (Hyun et al., 2019; Kaminsky & Jordan, 2017; McGranahan, 2015; Sangalang et al., 2022) suggested a slightly different and thorough approach to cleanliness and sanitation amongst students especially in developing countries. While every person on the planet needs clean water, dignified sanitation and healthy hygiene practices, there are a variety of approaches and interventions that can be taken to help students have safe, convenient, reliable and sustainable wash facilities and services. The authors stated some of the approaches and interventions as menstrual hygiene management, integrated water resource management, hygiene behaviour change, and washing in emergencies. Jasper (2002) also explained below, how these strategies work. The Water Sanitation Hygiene (WaSH) and COVID-19 Strategy, work by improving handwashing behaviour, food hygiene and safe water practices by providing materials for handwashing and hygiene. Hygiene practices can be measured by observing behaviours such as handwashing, proper use of latrines, and effective monitoring. Also, sanitation and hygiene advocacy and communication strategy framework focus on sanitation, hygiene behaviours building, the use of toilets, disposal of faeces and washing. The communication initiatives World Health Organization (WHO) works with partners on promoting effective risk assessment and management practicals for sanitation in communities and health facilities. The author stressed how these strategies can help to improve hostel sanitation practices of students and their health by first, providing more support to local-level sanitation plans and strategies. Second, do more work on faecal sludge monitoring and management. Third, communicate the benefit of unresting in sanitation to schools in communities by supporting small-scale water and sanitation projects. The project can also include the construction of community school toilets, installation of handwashing stations and promotion of hygiene education, ensuring pipe water supply, behaviour change and community-led total sanitation in schools and hostels.

The finding further showed measures by which students could improve hostel sanitation practices which included utilizing and maintaining waste bins for proper disposal of refuse, washing and cleaning the toilets, promoting good hygiene habits through sensitization and health education, proper hand washing with soap and water after using the toilet room, and proper cleaning of the rooms, corridors, and surroundings. These strategies work to improve sanitation and health by educating and maintaining basic rules

for sanitation like students washing hands regularly with soap and warm water whenever they become soiled because of the removal action of water and soap on transient microorganisms. Proper hand washing with soap and water can reduce diarrhoea cases by up to 35% (Musinguzi & Tumushabe, 2018). Proper disposal of refuse will not only protect the environment but recycling or reusing these wastes benefits the environment by lessening the need to extract resources and lowering the potential for contamination thereby improving sanitation and health. Also, students should practice proper cough and sneeze etiquette. The results of this study also were in agreement with the findings of the following researchers (Emerson et al., 2004; Groce et al., 2011; Musa & Haque, 2016 & Rajaratnam et al., 1992) who concurred that the remedial methods of improving sanitation require supporting the local level sanitation plans and strategies, faecal sludge monitoring and management, and communicating to students/communities the benefits of investing in sanitation

Some measures and plans by school authorities to improve hostel sanitation practices in the university were also revealed. The school administrators may be able to help solve the problem of poor sanitation practices in the student hostels by providing adequate trash cans throughout the halls of residence and overseeing cleaners to keep the residences clean and lively. Also, promoting good hygiene through extensive education, provision of sufficient toilets and latrine facilities, ensuring constant water supply in the hostel and provision of adequate well-functioning toilets and latrine systems. These strategies could help to improve the hostel sanitation and practices of students and their health if school administrators adhere to these methods and students utilize them in synergy instead of in isolation. By utilizing these strategies by students and authorities, the menace of poor sanitation and its negative effects on students' health can be stopped or at least reduced to a manageable level. Some perceived effects of infections and diseases such as food poisoning, depression, diarrhoea, skin irritation, cholera, typhoid, malaria and dysentery are reduced or stopped when residential areas are clean and hygiene is promoted. Therefore, these could help to improve the hostel sanitation practices of students and their health. The following researchers (Chard et al., 2019; Sharma & Adhikari, 2022; Snel et al., 2000; Tayler, 2020) concurred that school administrators should be fully involved in ensuring that students engage in healthy sanitation practices. Tayler (2020) also suggested other methods of improving sanitation practices in schools as creating structures for layering the intervention, sensitizing keyholders through capacity building, and reaching out to students/communities through awareness campaigns.

Conclusion

The study revealed that the causes of poor hostel sanitation practices included water scarcity, lack of hygiene education, insufficient waste bins, and

overcrowding. These factors could lead to poor health conditions such as food poisoning, depression, diarrhoea, skin irritation, allergies, and cholera. However, some measures to improve hostel sanitation practices by students include utilizing and maintaining waste bins for proper disposal of refuse, washing and cleaning the toilets, proper hand washing with soap and water after using the toilet room, and proper cleaning of the rooms, and surroundings. The measures to be taken by the school authorities like promoting good hygiene through extensive education, provision of sufficient toilets and latrine facilities, ensuring constant water supply in the hostel and provision of adequate well-functioning toilets and latrine systems, must be taken to enhance hostel sanitation. Improved sanitation has significant impacts not only on health but on social and economic development particularly in developing countries.

Recommendations: Based on the findings of this study, the following recommendations were made:

1. wash-related materials and agents (i.e., supplying hand washing products, cleaning materials, washing equipment) should be regularly supplied to students living in the hostels to ensure quality cleaning services.
2. toilet cleaning checklist should be introduced to ensure quality cleaning services by cleaning professionals and low-cost menstrual hygiene-related disposal materials should be placed in existing buildings in female hostels.
3. the students should not depend on the cleaners of the hostel but should also participate in environmental sanitation in their hostels.

References

Abanyie, S.K., Ebenezer, E.A., Nang, B.D., Michael, N.A., Benard, F.B., & Amodu, C.C (2022). *Environmental Challenge, 26*(8) http://org/ 10.1016/ j.enve.2022.100546>gateright

Arnett, J. J. (2000). Emerging adulthood. A theory of development from the late teens through the twenties. *The American psychologist*, *55*(5), 469–480. https://pubmed.ncbi.nlm.nih.gov/10842426/

Chard, A. N., Garn, J. V., Chang, H. H., Clasen, T., & Freeman, M. C. (2019). Impact of a school-based water, sanitation, and hygiene intervention on school absence, diarrhea, respiratory infection, and soil-transmitted helminths: Results from the WASH HELPSRluster-RandomizedTrial. J*ournal of Global Health*, *9*(2), 020402. https://doi.org/10.7189/jogh.09.020402

Emerson, P. M., Lindsay, S. W., Alexan, Bah, M., Dibba, S. M., Faal, H. B., Lowe, K. O., McAdam, K. P., Ratcliffe, A. A., Waslraven, G. E., & Bailey, R. L. (2004). Role of flies and provision of latrines in trachoma control.*Lancet*, *363*(9415), 1093-1098. https://doi.org/10.1016/s0140-6736(04)15891-1.

Forever, V. (2022). W*hat is a hostel? An overview and tips for international travelers.* https://www.volnteerforever.com/article_post/what-is-a-hostel-an-overview-and-tips-for-international-traveler

Groce, N., Bailey, N., Lang, R., Trani, J.-F., & Kett, M. (2011). Water and sanitation issues for persons with disabilities in low- and middle-income countries: a literature review and discussion of implications for global health and international development. *Journal of Water and Health*, *9*, 617-627. https://doi.org/10.2166/wh.2011.198

Nwobi, C.A. (2022) Hostel sanitation practices for improved health status. Himalayan Journal of Applied Medical Sciences and Research. http//himjournals.com.article.

Hutton, G. (2017). How water scarcity causes poor sanitation. https://www.unicef.org.wash.wa

Hyun, C., Burt, Z., Crider, Y., Nelson, K. L., Sharada Prasad, C. S., Rayasam, S. D. G., Tarpeh, W., & Ray, I. (2019). Sanitation for low-income regions: A cross-disciplinary review. *Annu Rev Environ Resour*, *44*(1), 287-318. https://doi.org/10.1146/annurev-environ-101718-033327.

Kabir, A., Roy, S., Begum, K., Kabir, A. H., & Miah, M. S. (2021). Factors Influencing Sanitation and Hygiene Practices among Students In A Public University In Bangladesh. *PLOS One*, *16*(9), 0257663. https://doi.org/10.1371/journal.pone.0257663

Kaminsky, J., & Jordan, E. (2017). Qualitative comparative analysis for WASH research and practice. *Journal of Water, Sanitation and Hygiene for Development*, *7*(2), 196-208. https://doi.org/10.2166/washdev.2017.240

Mara, D., Lane, J., Scott, B. & Trouba, D. (2010). Sanitation and health. *PLOS Medicine*. e1000363. https://doi.org/10.1371/journal.pmed.1000363

Marshy, M . (1979) Social and psychological effects of overcrowding in Palestinian refugees in the West Bank and Gaza. Literature review and preliminary assessment of the problem. The International Development Research Centre fromhttp.//www.ncbi.n/m.nih.gov.

McGranahan, G. (2015). Realizing the right to sanitation in deprived urban communities: meeting the challenges of collective action, coproduction, affordability, and housing tenure. *World Development*, *68*, 242-253. https://doi.org/https://doi.org/10.1016/j.worlddev.2014..12.008.

Mangrio, E., & Zdravkovic, S. (2018). Crowded living and its association with mental ill-health among recently-arrived migrants in Sweden: A quantitative study. *BMC Research Notes*, *11*(1). https://doi.org/10.1186/S13104-018-3718-6

Musa, R., & Haque, M. (2016). Assessment of factors contributing to poor environmental sanitation in the university's student male hostel. *International Journal of Pharmaceutical Research*, *8*, 59-63.

Musinguzi D. and Tumushabe A. (2018) The Effect of Poor Sanitation on Public Health and Environment.A case Ag>esa>sanit

Nelson, M. C., Story, M., Larson, N. I., Neumark-Sztainer, D., & Lytle, L. A. (2008). Emerging adulthood and college-aged youth: An overlooked age for weight-related behavior change. *Obesity*, *16*(10), 2205-2211. https://doi.org/10.1038/oby.2008.365

Nworgu, B., & Yager, R. (2006). The STS-constructivist reform: Some discordant notes. *African Journal of Educational Studies in Mathematics and Sciences*, *2*. https://doi.org/10.4314/ajesms.v2i1.38584

Ogbonna, D., Amangabara, G., & Ekere, T. O. (2007). Urban Solid Waste Generation in Port Harcourt Metropolis And its Implications For Waste Management. *Management of*

Environmental Quality: An International Journal, *18*, 71-88. https://doi.org/10.1108/14777830710717730

Poague, K., Blanford, J. I., & Anthony, C. (2022). Water, sanitation and hygiene in schools in low- and middle-income countries: a systematic review and implications for the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *19*(5). https://doi.org/10.3390/ijerph19053124

Rajaratnam, G., Patel, M., Parry, J. V., Perry, K. R., & Palmer, S. R. (1992). An outbreak of hepatitis A: school toilets as a source of transmission. *Journal of Public Health Medicine*, *14*(1), 72-82. http://www.jstor.org/stable/45160192

Sangalang, S. O., Lemence, A. L. G., Ottong, Z. J., Valencia, J. C., Olaguera, M., Canja, R. J. F., Mariano, S. M. F., Prado, N. O., Ocaña, R. M. Z., Singson, P. A. A., Cumagun, M. L., Liao, J., Anglo, M. V. J. C., Borgemeister, C., & Kistemann, T. (2022). School water, sanitation, and hygiene (WaSH) intervention to improve malnutrition, dehydration, health literacy, and handwashing: a cluster-randomised controlled trial in Metro Manila, Philippines. *BMC Public Health*, *22*(1), 2034. https://doi.org/10.1186/s12889-022-14398-w

Snel, M., Bolt, E., & Postma, L. (2000). Challenges Facing school sanitation and hygiene education from the perspective of the school teacher. *Waterlines*, *19*, 25-28. https://doi.org/10.3362/0262-8104.2000.035

Tayler, K. M., Asako. (2020). *Improving Water, Sanitation, and Hygiene in Schools: A Guide for Practitioners and Policy Makers in Mongolia*. Asian Development Bank. http://dx.doi.org/10.22617/TIM200125-2

Uchegbu, S. (2000). Environment Sanitation, and Health. *Environmental Review Journal*, *3*, 206-214.

Uddin, M. (2019). *Advantages and disadvantages of hostel life*. https://medium.com/@merajpamir/advantages-and-disadvantages-of-hostel-life-9541f635b551

Uganda, W.A. (2022 June 23). *Status of water sanitation and hygiene in primary schools*. https://www.wateraid.org/ug.

Webster, M. (2022, March, 20). *The words of the week* - 3/20/20. https://www.merriam-webster.com/words-at-play/the-words-of-the-week.WHO. (2020).

J. of Family and Society Research 2 (2), December 2023, pp. 47 - 65

Age, Emotional Intelligence, Awareness and Communication as Factors in Marital Satisfaction among Military Personnel in South-South, Nigeria

Ogba, K.T.U.[1], Onyedire, N.G. [1], Ituma, E.A. [2], & Ogba, M.O. [3]
[1]Department of Psychology, University of Nigeria, Nsukka
[2]Department of Religion, University of Nigeria, Nsukka
[3]Faculty of Law, Abia State University, Uturu.

Corresponding author**:** kalu.ogba@unn.edu.ng

Abstract

We adopted a cross-sectional research design and hierarchical multiple regression analysis to investigate whether age, emotional intelligence, awareness, and communication are correlated with experiencing marital satisfaction among military personnel. Participants were 399 volunteered military personnel purposively drawn from the South-South region of Nigerian military barracks. The participants were administered off-line self-reported and validated measures: Marital Satisfaction, Emotional Intelligence, Awareness, and Communication scales. Four objectives were stated and thereafter tested as hypotheses. According to the results, age negatively predicted marital satisfaction such that being older was associated with less marital satisfaction among the military. Emotional intelligence positively predicted marital satisfaction. Greater awareness was associated with increased marital satisfaction. While responsive communication positively predicted marital satisfaction, blocked communication negatively did. It was concluded that age, emotional intelligence, awareness, and communication (responsive) are keys to marital satisfaction amidst the seemingly martially dissatisfying kind of military deployment.

Keywords: Marital Satisfaction, Emotional Intelligence, Awareness, Communication, Military Personnel

Introduction

The diverse challenging nature of the military work, which includes repetitive movement, and separation from friends and family due to deployment is stressful (Allen et al., 2011) and in turn, might influence military lifestyles (Hall, 2012; Riviere & Merrill, 2011). Changes in behaviour, problems with loved ones, addiction, poor mental health (Whisman & Uebelacker, 2012), and even suicide and suicidal attempts (Lavner, & Bradbury, 2010) are the likely aftermath of stress arising from work-related deployments that jeopardize marital satisfaction. In addition, most military personnel who are married or

cohabiting often are confronted with some type of family problems, and mental health disorders appear to further complicate family reintegration (Sayers et al., 2010). Thus, marriages involving military couples are thought to be more vulnerable to marital crises. Research shows that marital satisfaction is influenced by military life (Paley et al., 2013) and that military spouses are more likely to report marital discord than civilian spouses (Asbury & Martin, 2012).

Military deployments have been a major threat to marriages of military couples (Alvarez, 2006). For instance, Riviere et al. (2012) noted that the stresses of recent wars and the long and dangerous deployments have been shown to decrease marital quality while increasing infidelity and separation or divorce intent. Hence, to attain a certain level of marital satisfaction, there is a need to balance family demands with military work and deployments. Most extant works of literature had focused more on marital dissatisfaction and the inherent factors among military personnel (MacDermid et al., 2011). Therefore, our study not only bridges such a limited knowledge gap in marital satisfaction among the military but also extends military marital satisfaction studies beyond its usually known relationships with some variables like a marriage relationship, financial (mis)understanding, the satisfaction of sexual desires, physical violence, lack of love and moral commitment, etc (Najafi & Mirzajan, 2014).

Furthermore, we advocate that marital satisfaction is a function of underestimated contemporary psychological terms like emotional intelligence, age, awareness, and communication; that has been well-examined in other domains of psychology (Heidari et al., 2019; Litzinger & Gordon, 2005; Brunell et al., 2010); and this undermines the objectives of the study. We hypothesized that age, awareness, emotional Intelligence, and communication would be associated with marital satisfaction in the military. However, it should be noted that the daily important impact of emotional intelligence, awareness, and communication in marital satisfaction is not only limited to the military domain alone; as such, the implications of the findings of the study span through other domains. This is yet a unique aspect of the study as the findings could be used in future comparative studies.

Marital satisfaction, according to Tamaren (2010) cited in Anyamene and Etele (2020), is the feeling of happiness, pleasure, and contentment by the wife or the husband or both; when considering all the aspects of conjugal life. Najafi and Mirzajan (2014) noted that determinant positive factors in marital satisfaction cut across directly or indirectly every sphere of life and such factors that aided it include the quality of relationship before marriage, marriage relationship, communication, couple's personality, age, presence of children, influence of in-laws, satisfaction of sexual desires, occupational differences (including deployments/shifts), financial (mis)understanding, authenticity,

physical violence, lack of love and moral commitment (Greeff & Bruyne, 2000; Johnson et al., 1999). Among these myriads of factors, age, emotional intelligence, awareness (authenticity), and communication which seemed uncommon and less researched, especially in the military domain were considered for this study. We considered our variables of study because we observed that almost all old and recent studies (Hajihassani & Sim, 2019; Du Plooy & de Beer, 2018; Omidi & Talighi, 2019) had focused on other professions than the military. Therefore, our study does not only make a huge contribution to knowledge in ensuring a wholesome scientific inquiry, but it also affirms our claim that our findings could be contemporary. Meanwhile, age has been associated with marital satisfaction but the direction seems unclear.

Specifically, less evidence has either been documented or reported on the association of age and marital satisfaction in a normal population (Schmitt, et al., 2007; Sorokowski et al., 2017) let alone the military samples. Hence, there has been a shortage of empirical evidence which invariably has led to unclear conjecture regarding age-wise link or blueprint of research findings in extant literature (Lee & McKinnish, 2017; Lee & Shehan, 1989). It is germane that the role of age is evaluated in marital satisfaction, especially in the military sector. The evaluation of marital satisfaction in the military is important as the finding will help the military authority fashion out how best to leniently accommodate the personnel in military deployments and other tasks; as evidence reveals that most of these military personnel suffer marital dissatisfaction (Lares et al., 2019; Westman et al., 2004). Besides, more studies are needed to make further clarification on this age-link pattern in marital satisfaction.

Aside from age, the researchers were interested in understanding the roles emotional intelligence plays in ensuring marital satisfaction in the military. Emotional intelligence refers to the ability to monitor one's own and others' feelings and emotions to discriminate among them and to use this information to guide one's thinking and actions. No doubt that emotional intelligence and marital satisfaction have been extensively investigated using both local and western samples and contexts like the postmenopausal women in Borujen city, Iran (Heidari et al., 2019). Other areas that have witnessed extensive research involving emotional intelligence and marital satisfaction included Iranian women in early marriage (Hajihassani & Sim, 2019); other diverse married couples (Amazue et al., 2015; Anhange et al., 2017; Arshad et al., 2015; Ilyas & Habib, 2014; Jahanian & Shamllo, 2017; Omidi & Talighi, 2019); workers in different professions (Arshad et al., 2015; Manjula et al., 2016 cited in Kalsoom & Kamal, 2018**;** O'Connor et al., 2018), and equally amid married couples in most Nigerian churches (Eze & Mba, 2018). Most uniquely, none of the studies (to the knowledge of the researchers) have addressed emotional intelligence as it relates to marital

satisfaction in the military contexts. The results of this study will bring to the front burners of knowledge the military kind of experience as far as emotional intelligence versus marital satisfaction. Our findings will moreover, affirm the fact that emotional intelligence and marital satisfaction seem to be fundamental to the optimal wellbeing and functionality of individuals given the extant vast and increasing empirical evidence and research interests.

Communication in marital satisfaction, like emotional intelligence, is indispensable. Communication is the process of passing information and understanding from one person to another. Gottman (1982) identified communication skills as the "key" to successful, satisfying marital relationships. With effective communication skills, couples spend more time sharing their emotions and less time in conflict (Kirchler, 1989). According to studies, the main factors associated with positive communication include active listening, self-disclosure and conflict resolution (Pfeiffer, 1998). Onyeizugbo (2005) distinguished three dimensions of communication, namely, responsive communication, blocked communication and self-disclosure. Responsive communication is a positive pattern of communication whereby the individuals feel validated. Blocked communication is a negative pattern of communication which is often ineffective for both parties and none of the parties feels understood. Self-disclosure as discussed earlier is the expression of one's thoughts, feelings, strengths and weaknesses to the other party. Irrespective of the dimension, communication is very important in marital satisfaction as it has generated a lot of research interest worldwide. This has been examined in various dimensions (Christensen & Sullaway, 1984; Ledermann et al., 2010; Nina, 1991), contexts/ sample/populations (Bravo & Martínez, 2016; Haris & Aneesh, 2018; Madahi et al., 2013; Shebib, 2016; Tan et al., 2017), professions (Amazue et al., 2015; Massod & Mazahir, 2015; Wilmarth et al., 2014) and with the deployment of various research apparatus (Bravo & Martínez, 2016; Hou et al., 2018). The military professions are rarely delved in. The reasons for this scarcity of information from the military domain may not have fallen within the scope of this study. But it is interesting to know that such a knowledge barrier in that profession is gradually being broken and more rigorous research efforts from interested scholars will help the military overcome most of their challenges. Most military personnel likely seem to suffer from accumulated marital challenges that would have been solved/avoided if their kind of profession provided a communicating opportunity, therefore, our study is crucial both for the military profession and the development of the body of knowledge.

Awareness that latently relates to marital satisfaction seems to have attracted less global research interest unlike emotional intelligence and communication. We operationalized awareness in line with Kernis and

Goldman's (2004) proposition as the perception of trust and knowledge of one's motives, feelings, desires, and self-relevant cognitions. In other words, being able to genuinely understand, accept, and adjust one's feelings, motives and desires to the current real-life situations. It is one of the four dimensions of authenticity, which has scarcely been evaluated. Therefore, considering awareness in the military context is yet a laudable research feat that has ever been documented in the body of knowledge. To the knowledge of the authors, authenticity has scarcely been examined with marital satisfaction; leading to a dearth of empirical documentation in this aspect. However, most of the research evidence that existed was directly unrelated to awareness and marital satisfaction. For instance, self-esteem has been correlated with authenticity (Wang, 2015; Wang & Ziyi, 2018); authenticity as a potential mediator of the negative effects of attachment on relationship satisfaction (Rasco & Warner, 2016); authenticity, subjective happiness, and life satisfaction (Sarika, 2015). Findings from our study will be expository and may perhaps lead to this novel research trajectory.

Ultimately, our research is relevant as its impacts are not only limited to military situations but to every other marital environment requiring a balance between family demands and work shifts (and/or deployments) with the view to ensuring marital satisfaction. Whatever reason(s), we believe that marital dissatisfaction among military couples (especially) are indices of untold hardship, infidelity, separation, psycho-social instability, lack of concentration at work, and high cases of anti-social behaviours of most children of the affected couple. Therefore, the explanatory research solutions (if utilized properly) are not only essential to the military and for academic utilization but also to the larger society as the future occurrence of the above-mentioned negations would likely be averted or reduced for a better discharge of military duties, safer lives and property as well as saner society.

Objectives of the study: Specifically, the sought to investigate whether:

1. age is a factor in marital satisfaction among the military personnel,
2. emotional intelligence predicts marital satisfaction among military personnel,
3. awareness predicts marital satisfaction among military personnel, and
4. communication is associated with marital satisfaction among military personnel.

Hypotheses

The hypothetical relationship of our study is explained by the Dynamic Goal Theory of Marital Satisfaction (DGTMS) proposed by Li and Fung (2011). The theory contends that people have multiple goals to achieve in marriage and that these marital goals can be classified into three categories: personal growth goals, companionship goals, and instrumental goals. The priority of the three types underscores the dynamism. Earlier, Mills and Clark (1994) noted that the main concern of

couples in marriage is to meet each other's needs and satisfaction usually follows when these needs are met.

In line with the study objectives, we hypothesize the following:

H1: Age is a significant factor in marital satisfaction among military personnel.

H2: Emotional intelligence significantly predicted marital satisfaction among military personnel.

H3: Awareness significantly predicted marital satisfaction among the military personnel, and

H4: Communication is significantly associated with marital satisfaction among military personnel.

Methodology

Study Design: The study adopted a cross-sectional design.

Study Population: The population of the study consists of all the military personnel in four military establishments located in five States of the South-South region of Nigeria (Edo, Bayelsa, Cross River, Delta, and the Rivers States). Such military establishments in the Nigerian Armed Forces were the Army, Navy, and Air Force.

Sample Size Selection Procedure: We conveniently sampled 399 married military personnel. The military establishment had 5 units in each of the South-South States of Nigeria. Through the balloting technique, two units were picked in each State for the study. We consider our sample size appropriate since the military has the same customary bureaucratic operating system nationwide; as such any small sample could make a true representation. Besides, the military has a bureaucratic manner of information reservation, coupled with problems of availability. Thus, penetrating through the military is almost always impossible.

Instruments for Data Collection

Age: participants were asked to indicate their age in the column provided in the questionnaire.

Emotional intelligence: Married military couple completed the Brief Emotional Intelligence Scale (BEIS-10) (Davies, Lane, Davenport & Scott, 2010), a 10-item that measures the capacity of individuals to perceive, control, and evaluate emotions. Each item response is on a scale of 1 to 5, with a total score reflecting the average of responses on the 10 items. BEIS-10 demonstrates excellent internal consistency, test-retest reliability, and convergent and discriminant validity (e.g., Schutte, Malouff, Hall, Haggerty, Cooper, Golden & Dornheim, 1998; Heidari, et. al., 2019). Our sample also demonstrated an excellent internal consistency of .85.

Awareness: Participants filled the 12-item (1, 3, 4, 6, 9, 14, 20, 21, 29, 34, 36, and 38) Awareness subscale of the Authenticity Scale by Kernis and Goldman (2006). While authenticity measures one's genuine behaviour and expression of what one is like, awareness measures one's processing ability and knowledge of internal experiences in one's present situation. Kernis and Goldman (2006) reported an alpha coefficient of .90 and .80 for the authenticity scale and awareness subscale respectively; and a .79 test-retest reliability index for the

awareness subscale. Participants were rated on a five-point scale with total higher scores indicating higher dispositional authenticity/awareness. Items were directly and reverse-scored. The direct-scored items include (3, 4, 6, 9, 20, 21, 29, 34, and 38) while the reverse-scored items include (1, 14, and 36). We obtained an internal consistency of .77.

Communication: Participants also completed the 16-item Dyadic Communication Assessment Scale (DCAS) (Onyeizugbo, 2005). DCAS assesses the quality of communication among dyads – married persons as well as partners who are involved in close relationships with the view to facilitating self-understanding and psychological intervention in distressed relationships. DCAS has five response options. Items (like 1, 2, 3, 6, 11, and 13) that suggest ineffective communication are reverse scored while others are scored directly. Higher scores suggest higher dyadic communication in the relationship. The DCAS has the following psychometric properties: α = .90; and split-half reliability = .89. Exploratory factor analysis (Maximum likelihood; oblique rotation) with DCAS, gave rise to Responsive Communication (with items 4, 6, 7, 8, 9, 10, and 15) and α of .82; Blocked Communication (with items 1, 2, 3, 11 and 13) and α of .74; and Self-disclosure (with items 5, 12, 14, and 16) and α of .74. The DCAS had concurrent validity of r = .55 (p< .001) with the Assertive Behaviour Assessment Scale (Onyeizugbo, 2008). Confirmatory Factors Analysis (CFA) using SPSS AMOS version 25 of our sample revealed α of .80, .78, and .82 for Responsive communication, Blocked communication, and Self-disclosure respectively.

Marital satisfaction: Participants finally completed the 25-item Index of Marital Satisfaction (IMS) (Hudson, 1982) designed to measure the degree of satisfaction within the context of one's marital relationship. Items are rated on a five-point scale with Cronbach's alpha of .96 and 2-hour test-retest at .96. Items (1, 3, 5, 8, 9, 11, 13, 16, 17, 19, 20, 21, and 23) are direct scored while (2, 4, 6, 7, 10, 12, 14, 15, 16, 18, 22, 24, and 25) are reverse scored. The final score is obtained by adding together the result of the direct and reverse scores and subtracting 25 to obtain the participant's raw score, such that higher scores indicate adequate marital satisfaction, whereas lower scores indicate either problematic marital satisfaction or marital dissatisfaction. Previous studies (e.g., Amazue, Amazue & Onu, 2015; Onyishi, Sorokowski, Sorokowska, & Pipitone, 2012) in Nigerian samples have reported adequate reliability and validity for the IMS. Our CFA showed a one-dimensional structure of IMS with an internal consistency reliability of .83.

***Validation and Reliability*:** A pilot study was conducted with 149 military personnel drawn from military establishments in Akwa Ibom State, Nigeria (men = 126, women = 23, age range = 23-56 years, mean age = 38.31, *SD* = 8.24 years) to validate and establish the reliability indexes of the instruments. For emotional intelligence, Confirmatory Factors Analysis (CFA)

was conducted for the 10 items of the BEIS using SPSS AMOS version 25. Fit indices considered from the CFA were the normed chi-square ($\chi 2/df$)), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Goodness of Fit Index (GFI), Incremental Fit Index (IFI) and the Root Mean Square Error of Approximation (RMSEA). The normed chi-square(χ^2/df) below the cut-off value of 3.0 (Kline, 2005) or 5.0 (Bentler, 1990) is recommended. The CFI, TLI, IFI and GFI values of .80 are marginal fits, those greater than .90 are acceptable fits, while values greater than .95 are most preferred. RMSEA values lower than .10 indicates an acceptable fit, while values lower than .05 indicates a good fit (Hu & Bentler, 1999; Kline, 2010). Results of the pilot study showed that CFA marginally confirmed the one-dimensional structure of the Brief Emotional Intelligence Scale with the following fit indices; CFI=.85; IFI=.85; TLI=.80; GFI= .88 and RMSEA = .11. Internal consistency reliability (Cronbach's α) of the items was .81.

For awareness, the Confirmatory Factors Analysis (CFA) was conducted for the 45 items of the AI using SPSS AMOS version 25. CFA results for the four-factor structure of the Authenticity Inventory returned the following fit indices; CFI=.57; IFI=.58; TLI=.53; GFI= .69 and RMSEA = .12. Internal consistency reliability (Cronbach's α) of the items for the four subscales were .71 (awareness), .68 (unbiased processing), .74 (behavioural) and relational orientation (.74).

For communication, the Confirmatory Factors Analysis (CFA) was conducted for the 10 items of the DCAS using SPSS AMOS version 25. CFA results for the three-factor structure of the DCAS returned the following fit indices; CFI=.47; IFI=.50; TLI=.40; GFI= .78 and RMSEA = .11. Internal consistency reliability (Cronbach's α) of the items for the three dimensions were .79 (Responsive communication), .77 (Blocked communication), and .74 (Self-Disclosure).

For marital satisfaction, the Confirmatory Factors Analysis (CFA) was conducted for the 10 items of the BEIS using SPSS AMOS version 25. CFA results for the one-dimensional structure of the Index of Marital Satisfaction Scale returned the following fit indices; CFI=.41; IFI=.43; TLI=.37; GFI= .70 and RMSEA = .06. Internal consistency reliability (Cronbach's α) of the items was .83.

Ethical approval and informed consent: With a letter of introduction from the Department of Psychology, University of Nigeria, Nsukka, we met the Commander of each unit, explained the purpose of the research, and requested approval for the conduction of our study with their military personnel. Our procedures met relevant ethical guidelines and legal requirements in Nigeria to have warranted the ethical approval obtained from the Institutional Review Board, University of Nigeria, Nsukka (D.PSY: UNN.002107020) and that of the military approval. The participants gave their written consent after explaining the purpose of the research.

Inclusion and exclusion criteria: To preserve the homogeneity of the sample, all participants were required to be married and active in service. That equally accounted for the inclusion criterion. Those single/unmarried and non-active duty service personnel were excluded though the single/unmarried personnel would have been deployed severally. Their exclusion was based on the rationale that they may not feel (or have felt) well the impact of their deployments unlike the married couple.

***Method of Data Collection*:** With the permission of the Heads of the military units, we recruited and trained five research assistants (serving personnel from each unit), who assisted in administering and collating the questionnaires. With the recruited research assistants, participants were approached in their offices and residences. Those who volunteered were administered the paper-and-pencil self-report inventory. Questionnaires were administered by hand and took each participant an average of 15-20 minutes to complete. The participants were not compelled to give immediate attention to the questionnaires. The administration and collection of data lasted for a total of seven weeks and five days. Out of 409 questionnaires administered, 406 copies were completed and collected/returned giving a 99.2% return rate. Seven questionnaires out of the 406 questionnaires collected/returned were discarded for improper fillings such as the omission of (or double response to) an item (or more) items of the questionnaire, leaving a total of 399 that were used for data analysis. The research assistants were each paid little stipends. Participants were equally verbally appreciated.

***Data and Statistical Analysis*:** Pearson's Correlation (*r*) and hierarchical multiple regression analysis were conducted to examine the relationships among the study variables at $p < 0.05$ All analyses were conducted using Statistical Package for Social Sciences (SPSS) version 22.

Results

Demographic characteristics of the respondents

The respondents consist of 345 (86.5%) men and 54 (13.5%) women. Participants were drawn from all three miltary forces - Army (n = 141, 35.3%), Navy (n = 132, 33.2%) and Air Force (n = 126, 31.5%). There were 297(74.4%) recruits and 102(25.6%) commissioned officers; with a mean age of 37.6 years (SD = 8.56 years). In terms of religion, 309 (77.4%) were Christians while 90(22.6%) were Muslims. Participants' average number of children was 2.44 (SD = 1.57), while the average duration of marriage was 1.63 years (0.87 years).

Relationship of demographic factors, age, emotional intelligence, awareness, communication and marital satisfaction

In Table 1, older age was associated with lower marital satisfaction (r = -.12, p < .05). Emotional intelligence correlated positively with responsive communications (r = .17, p < .01), and marital satisfaction (r = .15, p <. 01); but

there was a negative relationship between emotional intelligence and blocked communication (r = -.15, p < .01). Responsive communication positively associated with marital satisfaction (r = .29, p < .001) but was not associated with blocked communication and awareness. Blocked communication was associated with less marital satisfaction (r = -.14, p < .01) but no with awareness. Greater awareness was related to marital satisfaction (r = .16 p < .01).

Table 1: Correlations of Demographic factors, age, emotional intelligence, awareness, communication and marital satisfaction.

Variable	1	2	3	4	5	6
1 Age	-					
2 Emotional Intelligence	.00	-				
3 Responsive Communication	-.14**	.17**	-			
4 Blocked Communication	.00	-.15**	-.05	-		
5 Awareness	.05	.20**	-.02	-.06	-	
6 Marital Satisfaction	-.12*	.15**	.29***	-.14**	.16**	-

Note: ***p<.001;** p<.01; * p<.05

Table 2 of step 1 above showed that age negatively predicted marital satisfaction, β = -.17, t(399) = -2.89, p<.01, indicating that being older was associated with less marital satisfaction. The unstandardized regression coefficient (B) showed that for each one-unit rise in age, marital satisfaction decreases by -.19 units. All the other demographic factors were controlled. The contribution of age in explaining the variance in marital satisfaction was 4% (R^2 = .04), and the model was significant, F(5, 387) =3.27

In step 2, emotional intelligence positively predicted marital satisfaction, β = .13, t(399)= 2.56, p<.05. The unstandardized regression coefficient (B) showed that for each one unit rise in emotional intelligence, marital satisfaction increases by .21 units. The contribution of emotional intelligence in explaining the variance in marital satisfaction was 2% (ΔR^2 = .02), and the model was significant, $F\Delta$(1, 386) = 6.56, p<.05, R^2= .06.

Awareness was added to the regression model in (Step 3) and it positively predicted marital satisfaction, β = .15, t(399)= 2.84, p<.01. The unstandardized regression coefficient (B) showed that for each one-unit rise in awareness, marital satisfaction increases by .31 units. The contribution of awareness in explaining the variance in marital satisfaction was 4% (ΔR^2 = .04), and the model was significant, $F\Delta$(7, 385) = 4.29, R^2= .18.

In the final step (Step 4), the two dimensions of dyadic communication were added and Responsive communication positively predicted marital satisfaction, β = .25, t(399)= 4.73, p<.001. The unstandardized regression coefficient (B) showed that for each one-unit rise in responsive communication, marital satisfaction increases by .60 units. Blocked

communication negatively predicted marital satisfaction, β = -.10, $t(399)$= -1.98, p<.05. The unstandardized regression coefficient (B) showed that for each unit rise in blocked communication, marital satisfaction decreases by -.27 units. The contribution of communication in explaining the variance in marital satisfaction was 9% (ΔR^2 = .09), and the model was significant, $F\Delta(3, 383)$ = 12.66, R^2= .14. Of all the variables that predicted marital satisfaction, responsive communication was the strongest predictor of marital satisfaction (β = .25).

Table 2: hierarchical Multiple regression predicting marital satisfaction by age, emotional intelligence, awareness, and communication

Predictors Step 1	Step 2			Step 3			Step 4					
	B	β	t	B	β	t	B	β	t	B	β	t
Age	-.19	-.17	2.89**	-.19	-.16	-2.78**	-.16	-.14	-2.42	-.18	-.16	-2.78**
Emotional Intelligence				.21	.13	2.56*	.10	.06	1.27	.04	.03	.51
Awareness							.31	.15	2.84**	.21	.13	1.91**
Responsive Communication										.60	.25	4.73***
Blocked Communication										-.27	-.10	-1.98*
R^2		.04			.06			.18			.14	
ΔR^2		.04			.02			.04			.09	
F		3.27(5, 387)**			3.86(6, 386)**			6.35(7, 385)**			7.02(9, 383)**	
ΔF		3.27(5, 387)**			6.56(6, 386)**			4.29(7, 385)**			12.66(9, 383)**	

Note: ***p<.001;** p<.01; * p<.05; ΔR2= Change in R2; ΔF = Change in F

Discussion

Balancing family demands in ensuring marital satisfaction has been a major concern not necessarily to military personnel alone but also to every married working-class person whose nature of work requires deployment/shifts. Our study, using 399 military personnel explored how the military and those concerned could leverage the impact of emotional intelligence, awareness, and communication to ensure marital satisfaction. Specifically, the age of the military personnel was found to negatively predict marital satisfaction, indicating that being older was associated with less marital satisfaction. This could be explained by the negative impact of the military longer deployment cycle that usually has no age consideration (Sahlstein et al. 2009; SteelFisher et al 2008) where the military is periodically deployed to various stations. This abrupt separation of the soldier at perhaps older age when he/she has harmonized and bonded with family, relations and close friends, leaves the military personnel with lots of uncertainty and worry about how the physical separation will impact the state of their marriage unity, joy and happiness in the future. Thus, leading to marital dissatisfaction.

Ordinarily, the news of deployments and its associated premeditated effects, trigger a lot of anxiety, fear of the unknown, heightened emotional stress,

and all of which threaten marital satisfaction (Allen, et. al., 2011). We found that emotional intelligence positively predicted marital satisfaction, indicating that greater emotional intelligence was associated with increased marital satisfaction. This implies that for a military couple to be maritally satisfied amidst long dangerous deployments and military tasks, they should exhibit a high sense of emotional self-regulation, flexibility, and self-competence, not allowing the anxiety and fear of the unknown attached to deployment (Karney et al 2012) overwhelm them. That is, subjecting the deployment situation to critical examinations while consciously seeing only optimism before taking a decision and action rather than acting on impulse due to unbridled deployment emotions. Our finding is, however, consistent with most previous studies (Heidari, et. al., 2019; Hajihassani & Sim, 2019) done in various populations and across countries; confirming and indicating the powerful cross-sectional impact of emotional intelligence (Arshad et al 2015).

We also found that awareness, an aspect of authenticity, was positively associated with marital satisfaction, indicating that greater awareness was associated with increased marital satisfaction. This means that those high in the cognitive examination, positive perception, and appreciation of the reality of deployment are more likely to be flexible, have their self-trust, self-reliance, and knowledge of one's motives, feelings, desires (Kernis & Goldman, 2004) enhanced; which in turn, are necessary to cope and adapt with marital demands and pre-post deployments. Therefore, being authentic with marital affairs enhances trust; which invariably paves the smooth way to acquiring marital satisfaction

In addition to early studies (like Pfeiffer's, 1998), the observation that the main factors associated with positive communication include active listening, self-disclosure, and conflict resolution; and that poor communication skills have been linked with unhappy couples who are most likely to suffer from marital dissatisfaction and distress (Litzinger & Gordon, 2005). We found that **r**esponsive communication positively predicted marital satisfaction, showing that greater responsive communication was associated with increased marital satisfaction and that blocked communication negatively predicted marital satisfaction, such that greater blocked communication was associated with a reduction in marital satisfaction. It follows that military couples who can adequately share more closely with their partner the challenges of their family and deployments; agreeing together on how to overcome them, may likely have more marital satisfaction. A similar result is obtained when communication is unblocked among military couples. Our finding is consistent with other studies such as Bravo and Martínez's (2016) study on communication style, and Schrodt et al (2014) study on communication patterns.

We anchor the explanation of our findings on the Dynamic Goal Theory

of Marital Satisfaction (DGTMS) proposed by Li and Fung (2011) as explained earlier. Thus, when people sense that a certain goal is desirable; they may not only seek the goal for themselves but also provide opportunities for the spouse to fulfill that goal. Hence, helping their spouse fulfil such a goal influences their marital satisfaction as they feel fulfilled and successful. So, to maintain a balance between family demands and deployments in ensuring marital satisfaction, according to DGTMS, requires an emotional understanding of the family goals, being knowledgeable of the understood family goals, properly prioritising marital goals as well as the corresponding challenges and amicably expressing couples' mutually desired marital goals. This assertion corresponds with extant empirical proof suggesting that providing support to one's couple is as important as receiving support from the other for mutual maintenance of marital satisfaction (Brown et al 2003; De Jong Gierveld & Dykstra, 2008; Thomas, 2010).

Limitations of the study

In the course of this study, we encountered some limitations. For instance, for cross-cultural generalization of findings that require considerably large participants, our small sample size may not have been large enough. Similarly, we did not consider in the sampling procedures those individual differences, interests and choices in terms of what actually will make one's marriage satisfied as this definitely would have ensured a more homogenous population. Further research may consider such differences and possibly incorporate other differences that might play a role in marital satisfaction among the military. Furthermore, our study cannot make complete inferences about cause-effect directionality as it is cross-sectional in nature. The reliability and validity of our instruments may have been threatened by the self-reported measurement we used and this may have paved the way for response biases as respondents could either have made socially acceptable answers rather than being truthful or be unable to accurately assess themselves. Likewise, such scales as the emotional intelligence, awareness, communication and marital satisfaction we employed were simply screening tests to categorize participants of groups who may have been predisposed to marital satisfaction but were not necessarily diagnostic. Consequently, the results arising from these scales may simply indicate how (and what) the military personnel make out of marital satisfaction but may not themselves have concerns regarding marital satisfaction. Hence, future studies should perhaps attempt to make more causal suppositions, possibly from a more controlled experimental investigation. Our study could not also consider the several ways and yardstick people used to access and understand marital satisfaction as marital satisfaction seems to be relative and subjective. This area should further be examined. Finally, selection bias could have

confounded the internal validity of the study. However, the use of this approach might not have a significant impact on the outcome of our study. Nonetheless, this can be best established in subsequent research while taking into consideration the issues raised. We, therefore, recognize and acknowledge this as a flaw of the sampling technique we adopted and advise the exercise of caution in making generalizations from our findings. As a result of these limitations stated above, we recommend that future studies should ensure adequate representativeness, increased homogeneity, etc. to foster generalizations of the findings.

Conclusion

Balancing family demands and deployments in ensuring marital satisfaction requires flexibility, assertiveness, awareness, expression, management, and control of emotions, self-esteem, low impulsiveness, communication skills, self-motivation, stress management, social competence, trait empathy, trait happiness, and trait optimism. Age correlated with marital satisfaction such that older military personnel experienced less marital satisfaction. Emotional intelligence predicted marital satisfaction as those higher in emotional intelligence were associated with increased marital satisfaction, and awareness (an aspect of authenticity) was positively associated with marital satisfaction, indicating that those high in the cognitive examination, positive perception, and appreciation of the reality of deployment are more likely to be flexible and be satisfied with their marriage. Finally, communication is an important factor in marital satisfaction among the military indicating that military couples who share more closely with their partner the challenges of their family and deployments; agreeing together on how to overcome them, may likely have more marital satisfaction. Thus, age, emotional intelligence, awareness, and communication are important factors in marital satisfaction among the military.

Recommendation

Our findings, therefore, highlight the need for a solid guideline for policies and programs that may support military families facing deployment challenges; especially, programs that promote or facilitate effective stress coping experienced during and after deployment as this may have beneficial ripple effects on the military personnel and the families.

References

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2011). On the home front: Stress for recently deployed Army couples. *Family Process; 50*:235–247. doi:10.1111/j.1545-5300.2011.01357.x.

Alvarez, L. (2009, September 27, 2009). Wartime soldier, conflicted mom. *The New York Times,* p. A1. https://www.nytimes.com/2009/09/27/us/27mothers.html

Amazue, L. O., Amazue, L. E., & Onu, D. U. (2015). Communication pattern, emotional intelligence, and educational status as factors in marital satisfaction. *Nigerian Journal of Psychological Research, 11,* 1-8. www.njpsyresearch.com

Anhange, S. T., Iorwuese, P. A., Kwaghgbah, A. T., Iortsughun, S. T., & Aondona, A. T.(2017). Emotional intelligence, happiness, hope and marital satisfaction among married people in Makurdi Metropolis, Nigeria. *Gender and Behaviour, 15*(3).*235-46*. https://www.ajol.info/index.php/gab/article/view/165584.

Anyamene, A. & Etele, A. V. (2020). Relationship between emotional intelligence and marital satisfaction of male and female married teachers in Anambra State. European Journal of Educational Sciences,7(3) 57- 66. DOI: 10.19044/ejes.v7no3a1

Arshad, M., Abbas, I., & Mahmood, K. (2015) Emotional intelligence and marital adjustment among professionals of different organizations. *Research on Humanities and Social Sciences, 5*(1), 128-133. https://core.ac.uk/download/pdf/234674522.pdf

Asbury, E. T., & Martin, D. (2012) Military deployment and the spouse left behind. The Family Journal, 20: DOI: 10.1177/1066480711429433.

Bergmann, J. S., Renshaw, K. D., Allen, E. S., Markman, H. J., & Stanley, S. M. (2014). Meaningfulness of service and marital satisfaction in Army couples. *Journal of Family Psychology, 28*(5), 701–706. https://doi.org/10.1037/fam0000013

Bravo, C. S., & Martínez, A. W. (2016). Profiles using indicators of marital communication, communication styles, and marital satisfaction in Mexican couples. *Journal of Sex & Marital Therapy*. doi: 10.1080/0092623X.2016.1168332.

Brown, S. L.; Nesse, R. M.; Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it. *Psychological Science, 14,* 320–327. doi:10.1111/1467-9280.14461.

Brunell, A. B., Kernis, M. H., Goldman, B. M., Davis, P., Cascio, E.V., & Webster, G. D. (2010). Dispositional authenticity and romantic relationship functioning. *Personality and Individual Differences, 48*(8), 900-905. https://www.sciencedirect.com/science/article/abs/pii/S0191886910000802

Christensen, A., & Sullaway, M. (1984). *Communications Patterns Questionnaire*. Los Angeles: University of California.

David, P., & Stafford, L. A. (2013). Relational approach to religion and spirituality in marriage: The role of couples' religious communication in marital satisfaction. *Journal of Family Issues, 36*, 232–249. https://doi.org/10.1177/0192513X13485922

Davis, K.A.; Lane, A.M.; Davenport, T.J., & Scott, J.A. (2010). Validity and reliability of a Brief Emotional Intelligence Scale (BEIS-10). *Journal of Individual Differences, 31,* 198-208. https://www.researchgate.net/publication/241843539_Validity_and_Reliability_of_a_Brief_Emotional_Intelligence_Scale_BEIS-10

De Jong Gierveld, J., & Dykstra, P. A. (2008). Virtue is its own reward? Support-giving in the family and loneliness in middle and old age. *Ageing & Society, 28,* 271. doi:10.1017/S0144686X07006629.

du Plooy, K., & de Beer, R. (2018). Effective interactions: Communication and high levels of marital satisfaction. *Journal of Psychology in Africa, 28*(2), 161-167. doi: 10.1080/14330237.2018.1435041.

Eze, E. O. & Mba, E. (2018). Emotional intelligence and self-esteem as predictors of marital satisfaction among married couples in Nigeria. *International Journal of Humanities and Social Science Invention (IJHSSI), 7*(3), 4-13.

Greeff, A. P., & Bruyne, T. (2000). Conflict management style and marital

satisfaction. *Journal of Sex & Marital Therapy, 26*, 321-334. https://www.researchgate.net/publication/12269613_Conflict_Management_Style_and_Marital_Satisfaction

Haris, F., & Aneesh, K. P. (2018). Marital satisfaction and communication skills among married couples. *Indian Journal of Social Research*, *59(1),* 35-44. https://www.researchgate.net/publication/324680369_Marital_Satisfaction_and_Communication_Skills_among_Married_Couples

Hajihasani, M. & Sim, T. (2019). Marital satisfaction among girls with early marriage in Iran: emotional intelligence and religious orientation. *International Journal of Adolescence and Youth, 24*(3), 297-306. doi: 10.1080/02673843.2018.1528167.

Hall, A, (2012). [Review of the book Child psychology and psychiatry: Frameworks for practice, by D. Skuse, H. Bruce, L. Dowdney & D. Mrazek]. *Child and Adolescent Mental Health*, 17(2**),** 126.

Heidari, M., Shahbazi, S., Ghafourifard, M., Sheikhy, R. A. (2019). Prediction of marital satisfaction based on emotional intelligence in postmenopausal women. *Journal of Menopausal Medicine, 23,* 196-201. https://www.ncbi.nlm. nih. gov/pmc/articles/PMC5770530/

Hilpert, P., Randall, A. K., Sorokowski, P., Atkins, D. C., Sorokowska, A., Ahmadi, K., & Yoo, G. (2016). The associations of dyadic coping and relationship satisfaction vary between and within nations: A 35-nation study. *Frontiers in Psychology, 7,* 1106. doi: 10.3389/fpsyg.2016.01106.

Hou, Y., Jiang, J., & Wang, X. (2018). Marital commitment, communication and marital satisfaction: An analysis based on actor–partner interdependence model. *International Journal of Psychology*. doi: 10.1002/ijop.12473.

Hudson, W. W. (1982). *Valmyr guide grading scales*. Tempe, Arizuana: Valmyr Company.

Gottman, J. M. (1982). Emotional responsiveness in marital conversations. *Journal of Communication, 32*(3), 108-120. https://www.researchgate.net/publication/229733698_Emotional_Responsiveness_in_Marital_Conversations

Ilyas, S. & Habib, S. (2014). Marital satisfaction and emotional intelligence among different professionals. *International Journal of Scientific & Engineering Research, 5*(11), 302- 307. https://www.ijser.org/researchpaper/Marital-Satisfaction-and-Emotional-Intelligence-among-Different-Professionals.pdf

Jahanian, M., & Shamloo, Z. S. (2017). The Effect of mindfulness on marital satisfaction: Emotional intelligence as a mediation. *Iranian Journal of Psychiatric Nursing, 5*(3). doi: 10.21859/ijpn-05031.

Johnson, M. P., John P. Caughlin, J. P., & Huston, T. L (1999). The tripartite nature of marital commitment: Personal, moral, and structural reasons to stay married. *Journal of Marriage and Family, 61*(1), 160-177.

Kalsoom, S. & Kamal, A. (2018). Emotional intelligence and multitasking ability predictors of marital adjustment of working married individuals. FWU Journal of Social Sciences,12(2), 60-73. Available from:https://www.researchgate.net/publication/331112380_Emotional_intelligence_and_multitasking_ability_predictors_of_marital_adjustment_of_working_married_individuals [accessed Jul 25 2023].

Karney, B. R., Loughran, D. S., & Pollard, M. S. (2012). Comparing marital status and divorce status in civilian and military populations. *Journal of Family Issues*, 33:1527–1594. doi:10.1177/0192513X12439690.

Kernis, M. H., & Goldman, B. M. (2004). Authenticity, social motivation, and well-being. In J. P. Forgas, K. D. Williams and S. M. Laham (Eds.), *Social motivation: Conscious and unconscious processes* (210–227). Cambridge, United Kingdom: Cambridge University Press.

Kernis, M. H. & Goldman, B. M. (2006). A multicomponent conceptualization of authenticity: Theory and research. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 284-357). San Diego: Elsevier.

Kirchler, E. (1989). Everyday life experiences at home: An interaction diary approach to assess marital relationships. *Journal of Family Psychology, 2*(3),311-336. https://doi.org/10.1037/h0080501

Lares, Jennifer D. & Lehenbauer, Kruti R., (2019). *Factors contributing to marital dissatisfaction and divorce in the military* (April 25, 2019). RAIS Conference Proceedings - The 12th International RAIS Conference on Social Sciences & Humanities, Available at SSRN: https://ssrn.com/abstract=3387588 or http://dx.doi.org/10.2139/ssrn.3387588

Lavner, J. A., & Bradbury, T. N. (2010). Patterns of change in marital satisfaction over the newlywed years. *Journal of Marriage and Family.2010;72*:1171–1187. doi:10.1111/j.1741-3737.2010.00757.x.

Ledermann, T., Bodenmann, G., Rudaz, M., & Bradbury, T. N. (2010). Stress, communication, and marital quality in couples. *Family Relations*, *59*(2), 195–206. https://www.researchgate.net/publication/263192614_Stress_Communication_and_Marital_Quality_in_Couples

Lee, G., and Shehan, C. L. (1989). Retirement and marital satisfaction. *Journal of Gerontology,44*, 226–230. https//doi.or/10.1093/geronj/44.6.s226

Lee, W.-S., & McKinnish, T. (2017). The marital satisfaction of differently aged couples. *Journal of Population Economics, 31(2), 337–362. https//*doi.org10.1007/s00148-017-0658-8

Li, T., & Fung, H. H. (2011). The dynamic goal theory of marital satisfaction. *Review of General Psychology, 15*(3), 246–254. https://doi.org/10.1037/a0024694

Litzinger, S., & Gordon, K. C. (2005). Exploring relationships among communication, sexual satisfaction, and marital satisfaction. *Journal of Sex & Marital Therapy, 31*(5), 409-424. https//doi.org/10.1080/00926230591006719.

Madahi, M. E., Samadzadeh, M., & Javidi, N. (2013). The Communication Patterns & satisfaction in married students. *Procedia - Social and Behavioral Sciences, 84*, 119 – 1193. https://www.researchgate.net/publication/270849480_The_Communication_Patterns_Satisfaction_in_Married_Students

Massod, A., & Mazahir, H. (2015). Relational communication, emotional intelligence, and marital satisfaction. *International Journal of Research Studies in Psychology,4*(4), 3-11. https://consortiacademia.org/wp-content/uploads/IJRSP/IJRSP_v4i4/1159-4337-1-PB.pdf

Mendenhall, W., Beaver, R. J., & Beaver, B. M. (2009). *Introduction to probability and statistics (13th edition)*. Belmont, CA: Brooks/ Cole.

Mills, J., & Clark, M. (1994). Communal and exchange relationships: Controversies and research. In R. Erber and R. Gilmour (Eds.), *Theoretical framework for personal relationships* (pp. 29–42). Hillsdale, NJ: Erlbaum.

Nina, E. (1991). *Comunicaci´on marital y estilos de comunicaci´on: Construcci´on y validaci´on* (Marital communication and communication styles: Construction and validation.) Master's thesis,

Universidad Nacional Aut´onoma de Mxico, Ciudad de M´exico, M´exico.

Najafi, Z.A & Mirzajan, T. A. (2014). A Study of Predicting Marriage Satisfaction based on Emotional Intelligence, Spiritual Intelligence & Self Efficiency. *Asian Journal of Medical and Pharmaceutical Researches, 4* (4). 160-166. https://ajmpr.science-line.com/attachments/article/28/Asian%20J.%20Med.%20Pharm.%20Res.%204(4)%20160-166,%202014.pdf

O'Connor, P., Izadikhah, Z., Abedini, S., & Jackson, C. J. (2018). Can deficits in emotional intelligence explain the negative relationship between abandonment schema and marital quality? *Family Relations*, *67*(4), 510-522. https://onlinelibrary.wiley.com/doi/abs/10.1111/fare.12320

Omidi, A., & Talighi, E. (2019). Prediction of couple's marital satisfaction based on emotion regulation. *International Journal of Educational and Psychological Researches, 3*, 157- 162. https://www.ijeprjournal.org/article.asp?issn=2395-2296;year=2017;volume=3;issue=3;spage=157;epage=162;aulast=Omidi

Onyeizugbo, E. U. (2005). *Dyadic Communication Assessment Scale: Technical report*. Nsukka: Department of Psychology, University of Nigeria.

Onyishi, E. I., Sorokowskib, P., Sorokowska, A., & Pipitone, R. N. (2012). Children and marital satisfaction in a non-Western sample: having more children increases marital satisfaction among the Igbo people of Nigeria. *Evolution and Human Behavior, 33*, 771–774. https://www.researchgate.net/publication/235741918_Children_and_marital_satisfaction_in_a_non-Western_sample_Having_more_childrden_increases_marital_satisfaction_among_the_Igbo_people_of_Nigeria

Paley, B., Lester, P., & Mogil, C. (2013). Family systems and ecological perspective on the impact of deployment on military families. *Clinical Child and Family Psychology Review*, 16, 245-265. doi: 10.1007/s10567-013-0138-y

Pfeiffer, W. J. (1998). Conditions that hinder effective communication. *The Pfeiffer Library, Jossey-Bass/Pfeiffer, 6*, 2nd Edition.

Riviere, L. A., & Merrill, J. C. (2011). Post-deployment indicators of single soldiers' weel-being. In S. MacDermid Wadsworth & D. Riggs (Eds), *Risk and resilience in U.S. military families* (pp. 305-323).New York, NY: Springer.

Riviere, L. A., Merrill, J. C., Thomas, J. L., Wilk, J. E., & Bliese, P. D. (2012). 2003-2009 Marital functioning trends among U.S. enlisted soldiers following combat deployments. *Military Medicine,* 177, 1169-1177. https://watermark.silverchair.com/milmed-d-12-00164.pdf?token

Rosso, B. D., Dekas, K. H., & Wrzesniewski, A. (2010*).* On the meaning of work: A theoretical integration and review.*Research in Organizational Behavior, 30*, 91–127. https://www.researchgate.net/publication/228661748_On_the_Meaning_of_Work_A_Theoretical_Integration_and_Review

Sarika, H. (2015). Life satisfaction: Testing a Structural Equation Model based on authenticity and subjective happiness. *Polish Psychological Bulletin, 46*(2), 278-284.

Sayer, N. A., Noorbaloochi, S., Frazier, P., Carlson, K., Gravely, A., & Murdoch, M. (2010). Reintegration problems and treatment interests among Iraq and Afghanistan combat veterans receiving VA medical care. *Psychiatric* Services. 61,589-597. Doi: 10.1176/ps .2010.61.6.589.

Schmitt, M., Kliegel, M., and Shapiro, A. (2007). Marital interaction in middle and old age: a predictor of marital

satisfaction? *International Journal of Aging and Human Development,65*, 283–300. Https//doi.org/ 10.2190/AG.65.4.a

Schrodt, P.; Witt, P. L., & Shimkowski, J. R. (2014). A meta-analytical review of the demand/withdraw pattern of interaction and its associations with individual, relational, and communicative outcomes. *Communication Monographs, 81*(1), 28-58. https//doi.org/10.1080/03637751. 2013.813632

Schutte, N.S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C. & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences,* 25(2), 167–177. https//doi.org.10.1016/S0191-8869(98)00001-4

Sorokowski, P., Randall, A. K., Groyecka, A., Frackowiak, T., Cantarero, K., Hilpert, P., … & Sorokowska, A. (2017). Marital satisfaction, sex, age, marriage duration, religion, number of children, economic status, education, and collectivistic values: Data from 33 countries. *Frontiers in Psychology, 8*, 1199. doi: 10.3389/fpsyg.2017.01199

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics, (6th ed).* Boston: Pearson Education.

Thomas, P. A. (2010). Is it better to give or to receive? Social support and the well-being of older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 65B,* 351–357. doi: 10.1093/geronb/gbp113.

Tan, K.; Jarnecke, A. M., & South, S. C. (2017). Impulsivity, communication, and marital satisfaction in newlywed couples. *Personal Relationships*. doi: 10.1111/pere.12190.

Urbina, S. (2004). *Essentials of psychological testing*. New Jersey: John Wiley & Sons.

Wang, Y. N. (2015). Authenticity and relationship satisfaction: Two distinct ways of directing power to self- esteem. *PLoS ONE, 10*(12), e0146050. doi: 10.1371/journal.pone.0146050.

Wang, Y., & Ziyi, L. (2018). Authenticity as a mediator of the relationship between power contingent self-esteem and subjective well-being. *Frontiers in Psychology, 9*, 1066. doi: 10.3389/fpsyg.2018.01066.

Westman, M., Vinokur, A. D., Hamilton, V. L., & Roziner, I. (2004). Crossover of marital dissatisfaction during military downsizing among Russian Army Officers and their spouses. *Journal of Applied Psychology, 89(5),* 769–779.

Wilmarth, M. J., Nielsen, R. B., & Futris, T. G. (2014). Financial wellness and relationship satisfaction: Does communication mediate? *Family and ConsumerScience Research, 43*(2),131-144.

Whisman, M. A., & Uebelacker, L. A. (2012). A longitudinal investigation of marital adjustment as a risk factor for metabolic syndrome. *Health Psychology. 31*, 80–86. doi:10.1037/a0025671.

Factors Associated with Parents' Intention to Adopt the Parental Control/Monitoring Application

Aluko K. E
Department of Computer Science Education,
Federal College of Education, Pankshin

Abstract

This study focused on the factors associated with parental intention to adopt parental control/monitoring applications. An online multi-item questionnaire, the Parental Control Monitoring Questionnaire (PCMQ) was used for data collection. The questionnaire was pretested on a sample of adults within the age range of 21 to 49 who had one or more teenage-aged (10 to 18) children. The assessment adopted the Technology Adoption Model and Protection Motivation Theory to assess Perceived Usefulness (PU) and Perceptions of the Ease of Use (PEU), with five (5) latent factors assessed. The quota sampling technique was used to select 150 teenagers and 150 parents in Jos, Nigeria. A total of 300 valid responses meeting the quota were received when completed, with a mean score of 3.0 and below depicting a positive attitude or response. Respondents were distributed across the country, including all five major geographical regions. Analysis followed a two-step procedure where the confirmatory factor analysis (CFA) preceded Structural Equation Modelling (SEM). Model fit, validity and reliability are assessed using a range of statistics, including parameter estimates and fit indicators including comparative fit index (CFI), the Tucker Lewis Index (TLI), root mean square error of approximation (RMSEA) and normed chi-square (CMIN). The factors that could make parents adopt parental control apps include; perceived severity, perceived usefulness, perceived vulnerability, and perceived innovativeness. It was determined that teenagers have continuous access to the Internet, without any supervision as a result of the technological illiteracy manifested by their parents as the relationships among these components are often complex with intriguing similarities and differences among the participants.

Keywords: ICT Resources, Technological, App, Parental Control, Parental Supervision

Introduction

The need for parental control and supervision of teenagers using a parental control/monitoring application (app) in this current high technology age, as well as the ubiquity of the internet and the mass proliferation of social media. This has led to growing parental concerns and the need for the aid of information and communication technology (ICT) regarding a societal issue referred to as the negative influence of using the internet (NIUI) by teens and younger adolescents (Eagle, 2020). The negative influence of using the Internet is the "use of the Internet that creates psychological, social, school and/or work difficulties in a person's life" (Beard & Wolf, 2021:37). It has also

gained behavioural scientists' attention worldwide (Twenge and Campbell, 2018). For parents, the negative influence of using the Internet is associated with the overuse of digital media and its associated negative consequences. Examples include a maladaptive drive to use the internet for a longer time than intended or exposure to inappropriate content (Aboujaoude, 2020). Numerous studies have shown the Negative Influence of Using the Internet to be associated with a wide range of problems for teenagers. These include (cyber)bullying, harassment, low self-esteem, poor grades, the propensity to be easily bored, getting "in trouble," attention deficit hyperactivity disorder, sleep disturbances and excessive daytime sleepiness, less favourable relations with parents, exposure to risky behaviours such as gambling, violence, pornography, blackmail and the disclosure of personal, private information (Nasaescu et al., 2018).

In psychology and human-computer interaction studies, findings have outlined some antecedents of The negative influence of using the Internet (NIUI). These include psychological (Caplan, 2021) and social factors, such as a higher frequency of parent conflicts and lower family functioning (Wartberg et al., 2021). Family factors have been given more attention in the past decade; however, more study is needed on how to foster or counter the negative influence of using Internet environments (Lam, 2021). Parents are faced with a large and growing threat of The negative influence of using the Internet (NIUI). In the interest of protecting teenagers, they have a wide variety of tools to combat the threat, including many types of Parental Control/Monitoring apps (PCMA).

The National Cybersecurity Alliance of Jos, Nigeria, suggests that PCMA programs are technological products that can be skillfully used to keep internet use among teenagers safe and productive while simultaneously leaving parents assured. These Parental Control/Monitoring apps (PCMA) products allow parents to set controls on their teenager's internet use (Gomez et al., 2020). There is a gap in extant studies on how parents act as key decision-makers to protect teenagers from the negative influence of using the Internet (NIUI). The current study addresses this gap by examining what motivates parents' decision to adopt the parental control monitoring application (PCMA) and whether some parents are better able to make the right choice than others. This study furthers our understanding of parent and teenage consumer behaviour and contributes to marketing theory on technology adoption by examining a unique context in which technology is adopted to benefit another, i.e. a person other than the adopter. From protection motivation theory (PMT), we first consider contextual factors for adopting a new technology, which, in this case, is to protect teenagers from a serious threat to which they are vulnerable. Teenagers refer to young adolescents between the ages of 10 and 18 years. From the technology adoption model (TAM), considered factors that address the consumers' expectancies of parental control monitoring application

(PCMA) were their perceptions of functionality and the usefulness of the model. Finally, the model considers a key personal factor, self-efficacy and its influence on parents' likelihood of adopting PCMA to address the problem of the negative influence of using the Internet (NIUI). These theories are combined because together they help to understand more clearly what makes parents adopt or not adopt technology to deter (NIUI) better than they could on their own.

The study proposes a model (Figure 1) that combines the elements of two theoretical frameworks illustrating how they complement one another to present a richer understanding of why and how parents may choose to adopt Parental Control/Monitoring apps (PCMA) than each could accomplish separately. The first subsection introduces the extent and problems associated with the negative influence of using the Internet (NIUI). This is followed by examples of PCMA consumers might adopt to address the negative influence of using the Internet (NIUI). Next, there is a discussion of parental motivations and the contextual elements that may lead parents to consider technical solutions to protect their teenagers. This is framed note within Parental Monitoring Technology (PMT) and introduces Parental Monitoring Technology-grounded Study hypotheses about how the threat of The negative influence of using the Internet (NIUI) and the exposure of their teenager to its negative consequences affect how useful parents perceive PCMA to be. The fourth subsection discusses the nature of the PCMA framed within the Technology Adoption Model (TAM). It puts forth a hypothesis regarding how perceptions of the usefulness of PCMA affect the likelihood of its adoption. The final section presents the literature and proposes hypotheses concerning parents' assessment of their efficacy in using control software (based on PMT) that affects their perceptions of the ease of use of the software that, according to TAM, ultimately leads to their decision to adopt it.

Figure 1: The Study Model

Theoretical Framework: Protection Motivation Theory

Parents' attempted mediation of teenager's media use is a global phenomenon (Sun, 2019; Shin, 2021). Parents have become increasingly concerned about their teenagers developing problematic conditions attributable to negative influences of using the Internet (NIUI) and have begun to consider methods of reducing device usage or filtering the content their teenagers can access. Adopting technology to protect one's teenager is an increasingly urgent issue today, driven by governmental agencies' warnings of spikes in cybercrimes (Sheng, 2020). A study suggests that with a balanced mediation strategy and the correct tools, parental monitoring of screen time can prove to be the most mutually beneficial experience for concerned parents and teenagers whose development can be adversely impacted by exposure to inappropriate or even dangerous content and online behaviours. According to the American Academy of Pediatrics, the consensus among parents and medical professionals seems to be to limit teenagers to about 1 to 2 hours a day of leisure screen time, not counting time spent on schoolwork (Papas, 2020). It is hoped that by doing so, there will be a revitalization of "traditional" media/entertainment (e.g. books, outdoor activities and face-to-face interaction with peers) so that teenagers will be socialized in a more balanced manner (Anderson, 2020). Protection motivation theory has been widely applied to contexts in which individuals are motivated to protect themselves and in contexts of individuals are motivated to take action to protect others. This makes protection motivation theory an appropriate framework for investigating why parents might take action to protect their teenagers from the negative influence of using the Internet (NIUI). Developing the model depicted in Figure 1 begins with contextual protection motivation theory-based hypotheses. These hypotheses describe how parents' perception of the context – the threats of The negative influence of using the Internet (NIUI) and the degree to which their teenager is vulnerable to it – coupled with their ability to act to protect their teenager influences their perceptions about how useful monitoring software PCMA will be for mitigating the threat (Hwang et al., 2021). According to protection motivation theory, both threat appraisal and coping appraisal positively predict protective action (Pechmann et al., 2021). Protection motivation theory proposes that people behave in ways to protect themselves and others based on the appraisal of threats and an appraisal of their ability to cope with those threats. In adopting a protection motivation theory, individuals appraise threats first by perceiving a threat's severity and assessing their vulnerability to that threat. The perceived severity of a threat (in the case of The negative influence of using the Internet (NIUI), the perceived likelihood that a teenager will be exposed to something online they ought not to be) will influence the decision to enact protection behaviours

(e.g. adopting parental controls) (Milne et al., 2019). Hwang et al. (2021) found a positive relationship between perceived threat and parents restricting or setting rules for teenager's internet use. Thus, parents might consider the risk that their teenagers will be negatively affected by being online. Some solutions, such as rule setting or moving the computer from a teenager's bedroom to a more central part of the house such as the living room are simple. While Hwang et al. (2021) demonstrate the role of protection motivation theory in predicting parental mediation of teenagers' internet use, they did not account for the use of technology, and thus, technological factors. As teenagers spend more time online – particularly with increases in online learning – the threat of The negative influence of using the Internet (NIUI) and their teenager's vulnerability to it increase as their ability to regularly monitor their teenager's online activity decreases. If parents perceive the risk to be high (e.g. severe threat), they will be more likely to seek out PCMA that they perceive will be useful to protect their teenager, leading to the first hypothesis:

H_1: Perceived threat severity positively influences the perceived usefulness of the parental control monitoring application (PCMA).

The second element of threat appraisal, perceived vulnerability, describes the extent to which parents perceive their teenager to be vulnerable to online threats (Rogers, 1983). Perceived vulnerability influences decisions about using protective behaviours (Prentice Dunn & Rogers, 2021). Hwang et al. (2021) found a positive relationship between perceived vulnerability and parents restricting or setting rules for teenager's internet use. Thus, parents who report a high perceived vulnerability, saying it is likely teenagers will be exposed to harmful things such as sexual content or predators, are more likely to take action to mitigate that threat. We propose that one such action is to seek out technological products such as parental control monitoring applications (PCMA) they perceive to be useful to protect their teenager, leading to the second hypothesis.

H_2: Perceived vulnerability to the negative influence of using the Internet (NIUI) positively predicts the perceived usefulness of PCMA.

The coping appraisal factors from Parental Monitoring Technology (efficacy and cost) that predict adopting a protective behaviour are aligned with the concept of innovativeness (Schillewaert et al., 2021; Sun et al., 2010). To engage in innovative behaviour, individuals must possess a strong sense of efficacy (a desire to intentionally make things happen through their actions; Bandura, 2001). The concept of innovativeness is defined as the tendency to adopt new things earlier than most members of a social system (Rogers, 1995). One study finds that self-efficacy is positively associated with innovativeness (Ng & Lucianetti, 2016). When one has a greater level of innovativeness, she/he will possess greater self-efficacy in

enacting protective behaviours. Those without such innovativeness may find it hard or effortful to adopt a parental control monitoring application (PCMA) to protect their teenager, which might colour their perceptions of PCMA's usefulness. Formally:

H_3: Personal innovativeness (PI) positively affects the perceived usefulness (PU) of Parental Control Monitoring Application (PCMA)

Parental Monitoring Technology provides a sound theoretical framework for understanding parental motivations to seek out solutions they deem useful in helping them protect their teenager. However, Parental Monitoring Technology is a useful model for all manners of protective behaviours including and beyond, technological solutions. The Technology Adoption Model (TAM) discussed in the next section specifically considers how increases in perceived usefulness influence decisions to adopt technologies.

Adoption of New Technology: The Technology Adoption Model (TAM)

The technology adoption model (TAM) is a robust and widely used theory (Mun et al., 2020) that suggests external factors affect consumers' perceptions of the ease of use (PEU) and usefulness (PU) of a technology. PEU and PU have been identified as crucial predictors of the acceptance of many technologies (King & He, 2020). According to TAM several external variables directly influence the PU of a technology (Davis, 2019:320). For example, perceptions, norms and expectations can all influence PU. Within a TAM framework, perceived severity or vulnerability to threats might increase an individual's perception of the usefulness of a technological solution. Thus, the relationships between perceived threat and vulnerability to perceived usefulness are common to both the Parental Monitoring Technology and Technology Adoption Model (TAM) frameworks. The next step in the model development links the Parental Monitoring Technology - based influences on perceived usefulness to the well-documented positive relationship between perceived usefulness and adoption intention of the TAM (Davis, 2019, p. 320). Perceived usefulness (PU) has positively impacted the adoption of new technologies in multiple contexts. These include the adoption of mobile banking apps (Raza et al., 2021); wearable healthcare technology (Zhang et al., 2021); mobile online shopping (Sohn, 2021); online reviews (Racherla & Friske, 2012; Mican et al., 2020); and driverless vehicle adoption (Diresehan & Can, 2020). The current study predicts a similar relationship between parents' perceptions of the usefulness of the parental control monitoring application (PCMA) and their intentions to adopt such technological solutions. Formally:

H_4: Perceived usefulness (PU) of parental control monitoring application will positively influence adoption intention.

Early technology adoption model (TAM) studies have shown that

perceived usefulness (PU) is a consistent and strong predictor of consumer adoption of various technologies (Davis, 2019; Subramanian, 2021). However, perceived ease of use is not as strong, as it is not always a consistent predictor of adoption (Subramanian, 2021; Perangi-Engin et al., 2016; Lie´bana-Cabanillas et al., 2021; Ekonomi dan Manajemen, 2021). These studies share that the technology is intuitive or the task/situation that technology solves is complex or dangerous. Such is the case with parents adopting parental control monitoring applications (PCMA) to mitigate The negative influence of using the Internet (NIUI) on their teenager. This is such a complex issue that the perceived ease of use of the technology is likely irrelevant. Parents' decisions to protect their teenager with PCMA are more likely to be affected by their ability than how difficult the technology is to use. Consequently, perceived ease of use is not examined in this Study. Instead, we examine the parents' ability to cope per se by considering ease of use from the standpoint of their assessment of their ability to use the PCMA that links to the self-efficacy construct from parental monitoring technology.

Parental Characteristics and Technological Products

While the designer or marketer of a new technological product might believe that said product is easy to use, not every parent will perceive it to be so. Much depends upon personal factors such as the parent's efficacy in using such products. Along with threat appraisal, Parental Monitoring Technology suggests coping appraisal plays a role in predicting protection behaviour. Coping appraisal begins with consumers looking to minimize barriers or maximize the help from engaging in an intervention (Prentice-Dunn & Rogers, 2021). Coping appraisal describes parents' beliefs that they can enact a recommended behaviour to affect change (Prentice-Dunn & Rogers, 2021). For example, some individuals might have limited experience adopting technologies in the past. Thus, their ability to adopt PCMA to protect their teenager will be low or the effort will be high. On the other hand, those who often adopt new technologies will have a greater ability to adopt PCMA (e.g. one possesses the efficacy or experience to make the effort of adoption low). Self-efficacy will positively influence the likelihood of purchasing a PCMA to protect one's teenager from the negative influence of using the Internet (NIUI) (McMath & Prentice-Dunn, 2021). Intuitively, individual innovativeness should be related to the adoption of new technology. Midgley and Dowling (2020, 2021) defined individual innovativeness as the extent to which an individual can accept new knowledge and make innovative decisions. In their view, consumer innovativeness or "consumption of newness," is the tendency to buy new products more often and more quickly than other people. They suggest two measurable categories of individual innovativeness, namely, innate innovativeness which is related to

personality traits and actualized innovativeness which is related to innovative behavior. The former is a generalized personal inclination regarding innovation (Im et al., 2021). The latter is defined as how quickly individuals accept innovative things. In a marketing context, actualized innovativeness is conceptualized as purchase intentions, attitudes toward a new product, the relative time of the adoption of new products and the number of new products owned (Lassar et al., 2021). Zhang et al. (2020) applied this conceptualization in a recent study that assessed the relationship between innovativeness and the purchase of smart toys. That study verified the effect of perceived product innovativeness, consumer innovativeness and perceived value on consumers' purchase and adoption intention, which then leads to consumers' willingness to pay. Therefore, "consumer innovativeness" in this study represents individual innovativeness traits in the domain of new or smart technologies A protective behaviour is more likely to be adopted when the effort to do so is lower. Innovative people will need less effort to adopt new technologies to protect their teenagers. Studies have further demonstrated that innovativeness predicts adoption (Lin, 2021; Hirunyawipada and Paswan, 2021). For example, Donthu and Gilliland (1996) found that more innovative consumers were less risk-averse and more adventurous in their willingness to conduct in-home shopping from various sources. Therefore, the study proposes:

H_5: PI will positively predict intentions to adopt a parental control monitoring application.

Study Methodology

***Study Design*:** A cross-sectional survey was adopted for the study.

***Population of the study*:** A total population of adults aged 21 to 49 years and 10-18 years for teenagers in Jos North, Nigeria, 2023 showed 2000 parents and 1000 teenagers (JSS3-SSS3), as at the time of carrying out this research, were considered in this study (Jos North Education Board Archives, 2023).

***Sample Size Selection*:** A quota sampling technique was used to select a sample of 300 participants comprising 150 parents and 150 teenagers. Two procedures were taken to ensure participants were parents and teenagers and that the online response was robust. Sample characteristics and preliminary results were done through a survey conducted via Qualtrics Panels in September 2022. The sample was designed as a quota to yield at least 150 parents and 150 teenagers between 10 and 18 years of age. If the parent had more than one teenager in that age group, the survey asked for responses regarding the youngest teenager. If the parent had more than one teenager in that age group, the survey asked for responses regarding the youngest teenager. A quota of 50 teenagers per age category, paired with a parent (21 to 49 years) in each of the three age categories (10 to 13, 14-15, and 17-18) gave a total number of 150 teenagers and parents respectively.

Finally, the quota sampling plan yielded a minimum of 150 parents and 150 teenagers.

***Instrument of Data Collection*:** The instrument for data collection was an online multi-item questionnaire Control Monitoring Questionnaire (PCMQ). The PCMQ adopted the Technology Adoption Model (TAM) to measure five latent factors; Perceived Usefulness (PU), Perceived Severity, Perceived Vulnerability, Perceived Innovativeness (PI), and Adoption Intention. To assess the perceived severity of NIUI, the study adapted measures from Pechmann et al. (2021) to fit the context of parents' protective behaviours toward teenagers. The severity question asked subjects to rate their concerns that their teenager's online use would have five adverse outcomes. To assess perceived vulnerability, the study also adapted measures from Pechmann et al. (2021) to fit the context of parents' protective behaviours toward their teenagers. The vulnerability question asked subjects about their concern that their teenager would personally be exposed to three negative experiences highly associated with NIUI. To assess perceived usefulness (PU), the study adopted the scale from Hendrickson et al. (2021), where participants assess the functionality and applications of parental control.

***Reliability of the Instrument*:** The reliability of the instrument was established using the test-retest method. To ensure reliability, the researcher administered the questionnaires to a different set of respondents, collected them and analysed the responses. After two weeks the questionnaires were re-tested by administering them again to respondents with the same characteristics. This ensured the internal consistency of the questionnaire and affirmed the responses from the selected sample. Specifically, Cronbach's alphas are above 0.75 for all but one construct (a = 0.70) with high inter-item correlations between (0.30 and 0.80) for the items representing each construct within the model. Though the Parental Control Monitoring Questionnaire (PCMQ) has been a widely accepted measure for assessing PU and PEU, modifications were made to fit this study's context, where limited work exists.

***Validation of the Study*:** To ensure the accuracy of the data, the researcher used content validity to pre-test the questionnaires and make corrections on the questions that were not clear. The questionnaires provide accurate data due to the process of pre-testing in the selected sample to maintain validity.

Method of Data Collection:Data collection was done after pre-testing; an online survey was conducted using a representative sample of 150 parents and 150 teenagers aged 21-49 years and 10 to 18 years, respectively. A total of 300 out of the 300 valid responses which met the quota were received when completed. Overall, the survey took approximately 9.8min on average to complete.

Data and statistical analysis: The study hypotheses were tested using Structural Equation Modelling (SEM) with AMOS (Byrne, 2018). Analysis followed a two-step procedure where

the confirmatory factor analysis (CFA) preceded SEM. Where the mean score is greater than 3.0, it depicts a negative attitude or response by respondents, while the mean score of 3.0 and below depicts a positive attitude or response.

Results

Demographic characteristics of the respondents

The age range of the respondents was 21 to 49 years comprising adults who had one or more teenagers in JSS3 - SSS3, aged 10 to 18. The comprised 50% males and 50% females.

Factors associated with parental intention to adopt Parental Control/Management software

Preliminary data analysis using confirmatory factor analysis shows that the factors associated with parental intention to adopt Parental Control/Management software include Perceived Usefulness (PU), Perceived Severity, Perceived Vulnerability, and Perceived Innovativeness (PI). The CFA model has a good fit as reflected by the absolute, incremental, and parsimony fit indexes with c2 = 330.80 (df = 160, $p < 0.001$). CFI = 0.96, TLI = 0.96 CMIN = 2.01, RMSEA = 0.057. All average variance extracted values are above 0.50.

Hypotheses Testing

The structural model includes all five study constructs and five hypotheses. The fit statistics for the structural model show acceptable fit (Hair et al., 2020) with values similar to the CFA $\chi2$= 339.79, df:162, $p < 0.001$, CFI = 0.96, TLI = 0.96, CMIN = 2.10, RMSEA = 0.058). The results provided support for all five of the work hypotheses. The results support H1 and H2 concerning the positive relationships between the perceived severity of the threat of The negative influence of using the Internet (NIUI) and the perceived vulnerability of one's teenager to that threat and the perceived usefulness of a technological product that mitigates that threat. The results also support H3 which posits a positive relationship between the product's perceived usefulness and a parent's intention to adopt it. Finally, the results support H4 and H5 concerning the positive relationships between a parent's perceived level of PI and her perceived usefulness of such a product, as well as her intention to adopt it.

Table 1: Factors Influencing Parental Intention To Adopt The PCMA (N = 300)

Items	X	Decision

perceived severity of the threat of The negative influence of using the Internet (NIUI) and the perceived vulnerability of one's teenager to that threat	4.5	Negative attitude
the perceived usefulness of a technological product that mitigates that threat	2.6	Positive attitude
product's perceived usefulness and a parent's intention to adopt it	2.8	Positive attitude
parent's perceived level of Personal innovativeness (PI) and her perceived usefulness of such a product, as well as her intention to adopt it	2.9	Positive attitude

Further mediation analysis in Table 2 below was conducted to test the significance of adding perceived usefulness as a mediator in this model constructed based on Parental Monitoring Technology. The indirect effect of perceived severity, perceived vulnerability and PI on adoption, through perceived usefulness, was calculated using 200 bootstrapping samples with a 95% Bias Corrected Confidence interval. According to the analysis, perceived usefulness is a significant mediator for all three predictors.

Table 2: The Mediation Role of Perceived Usefulness And Parental Intention to Adopt The PCMA (N = 300)

Items	X	Decision
There is an indirect effect of perceived severity, on adoption, through perceived usefulness	2.5	Positive attitude
There is an indirect effect of perceived vulnerability on adoption, through perceived usefulness	2.6	Positive attitude
There is an indirect effect of Personal innovativeness (PI) on adoption, through perceived usefulness	2.8	Positive attitude

Discussion

The negative influence of using the Internet (NIUI) is a real and growing problem for adolescents and their parents worldwide. The internet poses very specific challenges, both regarding the nature of risk and for those seeking to protect teenagers and young people while supporting their online activities and privacy. This is the first study that we are aware of that examines the severity and Personal innovativeness (PI) as seen by a representative nationwide sample of parents of the important demographic of 15 to 18-year-olds. Additionally, it is also the first study to investigate the potential for personal control software solutions that may be used to help parents address this problem. A second major contribution of this work is that it examined multiple factors that predict the likelihood of parents' adoption of internet monitoring technology to safeguard their teenagers' online usage. In doing so, a more complete understanding is provided and new insights emerge. A substantial body of prior work successfully used TAM and Parental Monitoring Technology to

predict technology adoption to improve personal outcomes (King and He, 2006; Menard et al., 2021). Parental Monitoring Technology has also proven helpful in predicting health-related intentions and behaviours (Floyd et al., 2020).

However, few studies have examined their efficacy in explaining software solutions' adoption to protect others. Thus, the current study suggests that the Technology Adoption Model (TAM), when combined with Parental Monitoring Technology (PMT), may be applicable across a more comprehensive array of contexts beyond those in which it is traditionally used. Incorporating perceived severity, perceived vulnerability, perceived usefulness and perceived innovativeness (PI) on adoption intention, are factors combined into Parental Monitoring Technology using the TAM model. Using a social cognitive perspective, we tie in two theories of behaviour relevant to understanding what drives parents to adopt software to protect their teenagers from The negative influence of using the Internet (NIUI). Confirming the hypotheses, perceived severity and perceived vulnerability positively predicted the perceived usefulness of a software program that would supervise teenager's online activity and direct them toward approved sites. Further, PI, which is related to self-efficacy and the belief that future technologies will require less effort to adopt, is positively related to perceived usefulness. In turn, perceived usefulness and PI positively predict parents' adoption of internet monitoring software.

The findings advance current work on technology adoption in several important ways. Problematic internet usage is linked to several negative life and health outcomes and there are genuine dangers for teenagers with unrestricted internet access, including exposure to objectionable content and online predators (Rial et al., 2018; Sheng, 2020). This work shows that parents are more likely to enact protective behaviours (intend to adopt monitoring technology) when they perceive The negative influence of using the Internet (NIUI) to present a severe threat to which their teenagers are vulnerable. However, the perception of usefulness is a mediating factor. This mediation might explain the past disconnect between the perceived severity of the problem and the actual adoption rates of software solutions (Ghosh et al., 2018). The threat appears first to inform utility judgments such that a more significant perceived threat influences consumers to possibly overestimate or enhance the perceived utility of technology related to the threat.

Appealing to parents' perceptions of threats only addresses one of these complex situation factors. The environment (technology) must also be considered. Parents are concerned about the potential consequences of their teenager's online activity. The negative influence of using the Internet (NIUI) may hinder academic performance, inhibit physical activity and decrease interaction and communication with family members

and peers. However, simply identifying a problem without being able to implement a solution is insufficient. Software developers must also direct efforts to address such software's functionality and usability and marketers must communicate the ease of use to bolster users' sense of self-efficacy. Thus, by understanding and examining the relationship between perceptual factors of the environment and technology, it may be possible to increase the adoption of technological solutions to help keep teenagers safe online.

The second contribution lies in demonstrating the importance of personal factors predicting technology adoption to help others. One's innovativeness becomes a crucial factor driving the decision to act on behalf of another while also helping one's performance as a parent.

Parental Monitoring Technology considers consumers' efficacy, though TAM focuses on the efficacy of the technology or its ease of use. This work extends previous theories on the negative influence of using the Internet (NIUI) and technology adoption by integrating personal factors of the technology used that might spill over or inform their perceptions of technology and the likelihood of adopting it.

Implications of Findings

The major implication of findings regarding the effects of The negative influence of using the Internet (NIUI) is two-fold. For parents, the desire is to protect their teenagers from harmful content and from spending excessive amounts of time online. For their teenager, there are potential psychological effects such as fear, pain, anxiety and developmental issues associated with teens/young adolescents falling prey to violent topics and unscrupulous sexual predators in the absence of parental guidance. Part of this issue is the content to which teenagers may be exposed, such as sexually explicit, violent or politically objectionable material. Another issue is online bullying and potential contact with sexual predators. Finally, parents have concerns regarding the amount of time spent online, which negatively impacts interactions, academic performance and household activity.

However, parents use various approaches to deal with this issue including monitoring and supervision. This study shows that the great majority of parents (89.7%) now actively monitor their teenager's online school performance. We also know from this study that parents do not routinely access or monitor teenagers. Some parents may try to use restrictions on activities including a ban on e-mail, social media, chat rooms, instant messaging, online games and downloading content. However, realistically, such an approach is unlikely to be successful given the widespread proliferation and availability of mobile and internet-connected devices that are available to teenagers. Indeed, this study showed that the average teenager in the Jos,

Nigeria aged 15 to 18 has a wide assortment of such devices from which to choose. This ranges from 72.4% who have their smartphone to 43.0% with their computer. In addition, many of them also have access to a family computer or tablet. As Livingstone and Helsper (2018) note, based on their study of parental regulation of teenagers and teenagers' online activities, "[. . .] the simple assumption that introducing forms of parental mediation will reduce the risks young people encounter online, especially while protecting their opportunities, is misguided" (pp. 593). In addition, some parents (such as those in lower socio-economic environments) often lack internet and computer skills, compared to their teenagers. Therefore, they are less able to consistently monitor and supervise usage and to explain their potential negative consequences. For these reasons, PCMA has a great potential social benefit for addressing The negative influence of using the Internet (NIUI) if more widely adopted.

Limitations and future directions

As with any study, this work is not without its limitations. For instance, this work included various relevant threats parents perceived such as cyber-bullying. In the study, the variable did not load on any factor and decreased the reliability of the vulnerability construct. One reason for this might be that parents do not put this in the same category as other threats. Third, in addition to the TAM and Parental Monitoring Technology, several other models may help predict adoption intention. For example, according to the theory of planned behaviour, attitude, subjective norms and perceived behavioural control, all affect intention (Ajzen, 2019). Further, the technology acceptance model has also been expanded to include trust and risk (Pavlou, 2020). Thus, future work could explore attitudes, subjective norms and behavioural control or trust and risk as they may affect parents' intention to adopt internet monitoring software.

Conclusion

The negative influence of using the Internet is a concern for parents worldwide. Positive interactions were found among the perceived severity of the threat of the negative influence of using the Internet and the perceived vulnerability of one's teenager to that threat and the perceived usefulness of a technological product that mitigates that threat. Also, positive relationship between the product's perceived usefulness and a parent's intention to adopt the product, and between a parent's perceived level of innovativeness and the perceived usefulness of such a product, as well as their intention to adopt it, respectively. Perceived usefulness is a significant mediator for all three predictors; perceived severity, perceived vulnerability and perceived innovativeness on adoption.

References

Aboujaoude, E. (2020). Problematic internet use. *An Overview of World Psychiatry, 9*, 85-90,https://pubmed.ncbi.nlm.nih.gov/20671890/

Ajzen, I. (2021). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50(*2), 179-211.

Alt, D. and Boniel-Nissim, M. (2018). Parent–adolescent communication and problematic internet use: the mediating role of fear of missing out (FoMO*). Journal of Family Issues, 39*(13), 3391-3409.

A´lvarez, M., Torres, A., Rodrı´guez, E., Padilla, S. and Rodrigo, M.J. (2018). Attitudes and parenting dimensions in parents' regulation of internet use by primary and secondary school teenager. C*omputers and Education, 67*; 69-78.

Anderson, M. (2020). Parents, teens and digital monitoring. https://www.pewinternet.org/2016/01/07/parents-teens-and-digital-monitoring/ accessed 15th September 2020.

Aslanbay, Y., Aslanbay, M. and C., obano_glu, E. (2019). Internet addiction among Turkish young consumers: *Young Consumers, https://www.emerald.com/insight/content/doi/10.1108/17473610910940792/full/html 10*(1).

Bagozzi, R.P. and Yi, Y. (2021). Specification, evaluation, and interpretation of structural Equation models. *Journal of the Academy of Marketing Science, 40; 8-34. https//doi.org:+10.1007/s11747-011-0278-x&hl=en&as_sdt=0&as_vis=1&oi=scholart*

Bandura, A. (2021). Social cognitive theory: An agentic perspective. A*nnual Review of Psychology, 52*(1); 1-26.

Beard, K.W. and Wolf, E.M. (2021). Modification in the proposed diagnostic criteria for Internet addiction. C*yber Psychology and Behavior, 4*(3); 377-383.

Bisen, S.S. and Deshpande, Y.M. (2018). Understanding internet addiction: A comprehensive Review. *Mental Health Review Journal, 23*(3); 165-184.

Bleakley, A., Ellithorpe, M. and Romer, D. (2018). The role of parents in problematic internet use among US adolescents. *Media and Communication, 4*(3),https://repository.upenn.edu/items/259b0c03-340e-409e-a7c3-92415b543e1a 24.

Blum-Ross, A. and Livingstone, S. (2019). Families and screen time: Current advice and emerging work. https://www.basw.co.uk/system/files/resources/basw_64209-8_0.pdf Accessed 15 September 2020.

Boniel-Nissim, M. and Sasson, H. (2018). Bullying victimization and poor relationships with parents as risk factors of problematic internet use in adolescence. C*omputers in Human Behavior, 88*; 76-183.

Byrne, B.M. (2019). *Structural equation modeling with AMOS: Basic concepts, applications, And programming.* Routledge.

Caplan, S.E. (2020). Problematic internet use and psychosocial well-being. Development of a theory-based cognitive–behavioral measurement instrument. *Computers in Human Behavior, 18*(5); 553-575.

Caplan, S. E. (2018). Preference for online social interaction. A theory of problematic internet use and psychosocial well-being. *Communication Work, 30*(6), 625-648.

Caplan, S.E. (2020). Relations among loneliness, social anxiety, and problematic internet use. *Cyber Psychology and Behavior 10*(2); 234-242.

Carey, B. (2018). Is screen time bad for kids' brains. http://www.nytimes.com/2018/12/10/health/screen-time-kids-psychology.html Accessed 15, October 2020.

Clement, J. (2019). Internet usage for teenagers in the United States. Statista. https:// www. statista.com/topics/2016/teenagers-internet-usage-in-the-us/

Davis, F.D. (2019). Perceived usefulness, perceived ease of use, and user acceptance of Information technology. *MIS Quarterly, 13*(3); 319-340.

De Morentin, J. I. M., Corte, S., A., Medrano, C. and Apodaca, P. (2021). Internet use and Parental mediation. A cross-cultural study. *Computers and Education, 70;* 212-221.

J. of Family and Society Research 2 (2), December 2023, pp. 82 - 92

Use of Digital Marketing Resources for Business Management among Electrical Appliances Dealers in Enugu State

Madu, M.A.[1], & *Nnamani, V.O.[1]
Department of Business Education, Faculty of Vocational and Technical Education, University of Nigeria, Nsukka, Enugu State

*Correspondence: victoria.nnamani.pg90274@unn.edu.ng

Abstract

The study investigated the use of digital marketing resources for business management among electrical appliance dealers in Enugu state. Three objectives guided the study. The study adopted a descriptive survey research design. The population of the study was 54 respondents, made up of 36 employees and 18 marketing managers of the electrical appliances in the Enugu and Nsukka metropolis. No sampling was done due to the manageable size of the population. Mean and standard deviation were used to analyze data. The findings of the study revealed that Facebook (2.62), WhatsApp (2.62) and Instagram (2.67) were mostly used for marketing their businesses. The electrical appliance dealers do not use newsletter email sales and advertising (1.88), transactional email for business transactions (1.64) and behavioural email for reaching customers (1.73). The study also revealed that the dealers perform all the management tasks listed thus: creating goals and objectives, creating schedules, developing strategies to increase performance, productivity and efficiency, ensuring compliance with company policies and industry regulations, mentoring employees, monitoring budgets, and productivity levels and performance, train staff. Based on the findings, the study recommended that marketers of electrical appliances should be open to exploring more digital marketing resources to reach out to new and existing customers for better management of their businesses

Keywords: Digital Marketing, Business Management, Electrical Appliances, Resources.

Introduction

Digital marketing is the use of electronic devices such as computers and mobile phones for online marketing. Digital marketing is a product or service using digital channels to reach consumers (Ghazie & Dolah, 2018). According to Jeff (2019), some types of digital marketing are as follows: social media marketing, paid advertising and pay-per-click (PPC), email marketing, marketing analytics and reporting, mobile marketing, marketing automation and user experience design. This study will focus more on social media and email marketing which are mostly used in Nigeria. Social media marketing is a

form of internet marketing that uses social media apps as a marketing tool (Griffin, 2022). Social media platform enables brands to connect with their audience to: build a brand, increase sales and drive traffic to a website. Most people consider social media to be the only platform for posting updates and images on websites like Facebook, YouTube, Instagram and TikTok (Papasolomou & Melanthiou, 2012). Other types of social media resources include Blog, LinkedIn, WhatsApp, Twitter, Snapchat; Reddit; QuoraDigg, Yelp, Zumato, and Pinterest

Email marketing on the other hand is an opportunity to connect with users who are most likely to be new or returning customers through email (Feder,2021). It involves sending promotional or informational content. Email marketing is usually used to create product or brand awareness and generate leads or sales. Tay(2023), highlighted three important types of email marketing that can be used to earn the attention of customers and prospects. According to Tay, the email newsletter is one-off communication that can be used to send promotional messages, important account information, and product updates and help build brand recognition and awareness. To the author, in creating an email newsletter, content length, type of information, designs, call to action, and placement of images and text should be considered. Email receipts, invoices, billing statements, and order confirmations are examples of transactional emails. Behavioural emails are targeted messages based on a user's behaviour. By getting to know customers and creating buyer personas, dealers can tailor emails to be relevant to where customers are in the buying cycle. Digital marketing is an aspect of marketing that is very important in this technological era that electrical appliance dealers in Enugu state should embrace in business management.

Alexander (2019) outlined some of the importance of digital marketing as follows: Digital marketing helps marketers to reach a larger audience than could be reached through traditional methods, and target the prospects that are most likely to buy their products or services. It is more cost-effective than traditional advertising and enables marketers to measure success daily. Digital marketing allows the marketer to identify and target a highly – specific audience and send that audience personalized, high-converting marketing messages. It enables marketers to conduct the research necessary to identify the buyer persona and refine marketing strategy over time to reach prospects most likely to buy. Today hundreds of thousands of businesses engage in digital marketing, as it is found easier and more cost-effective to reach a large number of people this way (Membrillo, 2021). As people spend more time online, businesses must optimize their digital channels to reach potential buyers. This can be possible through the use of advertisements.

Advertising is a process of creating awareness among customers for the existence of new or old products.

Advertising is any paid form of non-personal presentation and promotion of ideas, goods and services through mass media such as newspapers, magazines, television or radio by an identified sponsor (Kotler, 2019). American Marketing Association(AMA),(2017) asserted that advertising is any paid form of non-personal presentation and promotion of ideas, goods and services by an identified sponsor. To the author, this definition mainly explains what advertising is and helps in distinguishing advertising from other communication initiatives with which it is often confused. Advertising does not involve only presentation and promotion, but an element of persuasion too. Any advertisement devoid of persuasion is not part of advertising and will only be considered as a communication link disseminating some piece of information to the masses. The role of advertising is to create demand for a product. Eric (2019), viewed advertising from two perspectives namely: Traditional advertising which is media that existed before the rise of the internet-newspapers, magazines, billboards, radio, broadcast television and direct mail. Digital advertising includes online or internet media – online advertising, search engines, social media, video streaming services and websites. To the author, Digital advertising also includes other online and mobile techniques such as geofencing, OTT (over-the-top) long-form video, and Digital OHH (digital out-of-home) such as digital billboards. The evolution of marketing technology has changed the mass media and advertising agencies over the years and allows companies and brands to take control of their products (Diyana, 2018). The era of marketers looking for local advertising agencies and radios is fading gradually.

According to Jeff (2019), digital marketing is always evolving, so it is crucial to know where to get the latest news and the best digital marketing resources - even the most trusted digital marketing resources can go out of date almost overnight – so the best platforms for marketers are always churning out fresh news and useful assets. Electrical Appliances are among the products that should be managed and marketed with digital marketing.

An electrical appliance is defined as current-using equipment; an electrical or mechanical machine which accomplishes a specific function (Electrical Contractors Association, 2021). Electrical appliances are normally used for domestic, commercial or industrial purposes and are often in three categories: consumer electronics – such as television, audio, IT, data processing, and others; small appliances – such as electric kettles, toasters, hair driers, beverage makers, and others; larger appliances such as refrigeration, cooking gas, laundry equipment and others. Electriveda (2020) asserted that an electrical appliance is a device or apparatus that is used to perform a function in our personal lives, other than industrial ones, with the help of electrical energy.

Effective digital marketing is an integral part of creating strong brand awareness as well as identifying and

establishing a concrete customer base for business (Numero, 2021). The key to accomplishing all of this is to not only find a target audience but to also define the specifications of the company's offerings and ensure those offerings (products and services) are in line with the needs and wants of the potential customers. In many ways, the brand image business projects serve as a guide for the target audience and preferred consumers to find a marketer rather than the marketer finding them. Consumer perceptions play a large role in determining whether the brand will flourish or fail. Almost everyone is online today. The Internet has become the most important medium for marketing today, especially digital marketing for marketing strategies. Today, digital marketing has become a phenomenon that brings together customization and mass distribution to accomplish marketing goals (Pineiro-Otero & Martinez-Rolan, 2016). For businesses to thrive especially electrical appliances in Enugu state it has to go digital for effective management.

Management is an act of working with and through a group of people to accomplish a desired goal or objective efficiently and effectively (Gulati, et. al 2017). Herrity (2022) asserted that management is the coordination and administration of tasks to achieve a goal. The author buttressed that such administration activities include setting the organization's strategy and coordinating the efforts of the staff objectives through the application of available resources. Electronic appliance dealers in Enugu state need to apply certain management skills in performing their tasks to run their businesses effectively. Some of these tasks according to Coursera (2023), include: creating goals and objectives, creating schedules, developing strategies to increase performance, productivity and efficiency, ensuring compliance with company policies and industry regulations, mentoring employees, monitoring budgets, and productivity levels and performance, resolve customers problem and train staff. All these tasks help in effective business management. Business management is the process of planning, organizing, directing and controlling the activities of a business or organization to achieve its goals and objectives (Lewis, 2022). To the author, it involves overseeing all aspects of a business, from finance and operations to marketing and human resources. Business managers must be skilled in leadership, communication, and problem-solving, and must be able to make strategic decisions that drive the success of the organization. Managers as used in this study may be the owners of the business or employed.

Nigerians are becoming increasingly comfortable with online, living more and more in the digital world, therefore agencies need to wake up to digital marketing. Consumers spend a lot of time now on the Internet. They go online to buy products and compare the prices, and product features, to get information towards online marketing rather than being conscious about the brand, electrical appliances dealers in Enugu state do not need to sit down in their shops waiting for customers while their counterparts from other

developed countries and main cities in Nigeria like Lagos and Abuja have gone far with the use of digital marketing. Therefore, to ensure that a product or service succeeds, awareness level must be managed across the entire product cycle from product launch to its decline. Electrical appliance dealers should embrace digital marketing. Some marketers of shopping products (electrical appliances) in Enugu state with their Android phones and iPads may not be making maximum use of them for online marketing and as such may not be using digital marketing effectively to market their products. Lack of knowledge on the proper use of available digital marketing has hampered the success of their business, hence there is a need to determine the use of digital marketing for business management among electrical appliances dealers in Enugu state which is the major purpose of this study.

Objective of the Study: The objectives of the study were to:

1. determine the social media marketing resources used in the management and advertising of electrical appliances in Enugu state.
2. determine the types of Email marketing resources used in business management by dealers of electrical appliances.
3. determine the management tasks performed by dealers of electrical appliances in business management.

Methodology

Design of the study: The study adopted a descriptive survey research design and was carried out in Enugu state. Nworgu (2015) defined descriptive survey research design as the one in which a group of people or items are studied by collecting and analyzing data from a few people or items considered to be representative of the entire group. Ponto (2015) also noted that descriptive survey research can use quantitative research strategies using questionnaires with numerically rated items and qualitative research strategies using open-ended questions or both strategies for data collection. Information gathered through descriptive surveys must be generalized to the whole population purposes.

Population of the Study:The population of the study was 54 respondents, made up of 36 employees and 18 marketing managers of the registered electrical appliances marketers with at least two employees. There was no sampling as the entire population was used for the study due to the small size of the population which was accessible and manageable.

Instrument for Data Collection:The instrument for data collection was a 24-item structured questionnaire. The questionnaire was structured into four sections (A, B, C and D) for data collection for the study. Section A of the questionnaire focused on the data collection of personal information of the respondents. Section B was used to collect data on the social media marketing resources used in the management and advertising of electrical appliances in Enugu state.

Section C covered data collection on types of Email marketing resources used in business management by dealers of electrical appliances. and Section D was used to collect data on the management tasks performed by dealers of electrical appliances in business management.

The response options of B, C and D were structured on a 4-point rating scale of Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagree (SD), with corresponding values of 4,3,2, and 1 respectively. The scales were in descending order with the highest positive response receiving the highest value of four (4) points and the lowest negative receiving the lowest value of one (1).

Validation and Reliability Test of the Instruments:The instrument used for data collection was validated by three Business Education experts from the Faculty of Vocational and Technical Education, University of Nigeria, Nsukka. The researcher distributed 54 copies of the instrument to the respondents (managers and employees) of registered electrical appliance dealers in Nsukka and the Enugu Metropolitan area of Enugu State. Copies of the questionnaires were distributed and collected by the researcher on the spot. All the copies of the administered questionnaire were retrieved representing a 100% return rate. The instrument was subjected to Cronbach Alpha reliability analysis. The result showed a reliability coefficient of 0.82, indicating that the instrument was reliable.

Statistical Analysis:Statistical Package for Social Sciences (SPSS 2021 version) was used to analyze the data collected from the respondents. The data were analyzed and interpreted using Means ($\bar{x}$), and Standard Deviations (SD). The boundary limit of 3.50-4.00 (Strongly Agree), 2.50-3.49 (Agree), 1.50-2.49 (Disagree), and1.00-1.49 (Strongly disagree) with the cut-off mark of 2.50.

Results

Social Media Resources Used in Management and Advertising Electrical Appliances

The data in Table 1 show the social media marketing resources used in the management and advertising of electrical appliances**.** From the data**,** respondents used only Facebook (2.62), WhatsApp (2.62) and Instagram (2.67). The table further showed that the standard deviations (SD) of the items were within the range of 0.70 to 0.85 in all 15 items, indicating that the options of the respondents were not far from each other in their responses to the 15 items.

Table 1: Mean Responses on the Social Media Resources Used in Management and Advertising Electrical Appliances

Item statement	$\bar{x}$	SD	Remarks
YouTube	2.22	0.77	Disagree
Facebook	2.62	0.71	Agree
Blog	2.38	0.71	Disagree
LinkedIn	1.98	0.82	Disagree
WhatsApp	2.62	0.71	Agree
Instagram	2.67	0.71	Agree
Twitter	2.40	0.63	Disagree
Tiktok	2.13	0.85	Disagree
Snapchat	2.26	0.67	Disagree
Reddit	2.38	0.81	Disagree
Quora	2.36	0.84	Disagree
Digg	2.34	0.67	Disagree
Yelp	1.96	0.70	Disagree
Zumato	1.93	0.65	Disagree
Pinterest	2.29	0.81	Disagree

Key: $\bar{x}$ – Mean, SD- Standard Deviation.

Email marketing resources used in business management

Data presented in Table 2 revealed that the respondents did not use newsletter email sales and advertising (1.88), transactional email for business transactions (1.64) and behavioural email for reaching customers (1.73), indicating that the respondents disagreed that all the 3 items on Email marketing resources were used among electrical appliances dealers in Enugu state. The table also revealed that the standard deviation (SD) of the items was within 0.53 to 0.64 in all the items, indicating that the respondents were not far from each other in their opinions.

Table 2: Mean and standard deviation scores of responses on the Email marketing resources used in business management

Item statement	Mean	Standard deviation	Remarks
Use newsletters email sales and advertising	1.88	0.53	Disagree
Use transactional emails for business transaction	1.64	0.58	Disagree
Use Behavioural email to reach customers	1.73	0.64	Disagree

Business Management Tasks Performed by the Respondents Using Digital Resources

The data in Table 3 show that the respondents agreed that the managers performed all the seven listed management tasks. The tasks include monitoring budgets (3.67), creating schedules (3.47), developing strategies to increase performance (3.35), training staff (3.17), creating goals and objectives (2.90) and mentoring employees (2.88). The standard deviations ranged from 0.49 to 0.7.

Table 3: Mean and standard deviation on the Business Management Tasks Performed by the managers Using Digital Resources

Item statement	($\bar{x}$)	SD	Remarks
Creating goals and objectives	2.90	0.71	Agree
Develop strategies to increase performance	3.35	0.57	Agree
Mentor employees	2.88	0.59	Agree
Monitor budgets	3.63	0.49	Strongly Agree
Create schedules	3.47	0.59	Agree
Train staff	3.17	0.67	Agree

Key: $\bar{x}$-Mean, SD-Standard Deviation

Discussion of Findings

The study found that of all the social media resources available, the electrical appliances marketers in Enugu State used three social media resources for marketing their products which are Facebook, WhatsApp and Instagram. They did not mostly use YouTube, Blog, LinkedIn, Twitter, TikTok, Snapchat and other social media marketing resource items for advertising their products. This implies that electrical appliance dealers might not be familiar with the vast social media platforms currently available or their knowledge of using such social media in advertising their products might be low. The finding of this study corroborated that of Nyekwere et al (2014), who assessed the use of social media as advertising vehicles in Nigeria with a focus on Facebook and Twitter and found that the use of social media in advertising by small-scale entrepreneurs has been very low due to their inadequate social media skills. The findings also conformed with that of Nnamani (2013) who investigated the rate of adoption of social media for marketing products and services among small and medium-scale enterprise owners in North- central Nigeria and found that the rate and extent of use of social media for market promotion is still very low due to illiteracy, lack of the required skills and poor readiness for technology adoption among small scale business operators.

The findings on the opinion of respondents on the types of Email marketing used for business management revealed that email marketing resources are not widely used among electrical appliances dealers. The business owners did not use newsletter email marketing for sales and advertising; they did not use transactional email marketing for business transactions, and they did not also use behavioural email marketing to reach customers. This finding also suggests that their level of knowledge and competence in using email digital marketing is low. The finding is also in line with Iwuchukwu and Uzuagu (2019), who stated that the majority of entrepreneurs do not possess the basic ICT skills and social media skills for the effective running of their businesses online. Also, Iddris (2012), opined that the use of online ICT skills among small-scale business entrepreneurs is relatively low due to a lack of basic skills in e-commerce.

The findings on business management tasks performed by the

dealers revealed that managers create goals and objectives for the business, create schedules of work for the employees and develop strategies by which employees' performances, productivity and efficiency are increased. The managers also ensured that employees complied with company policies and industry regulations by training and mentoring them, as well as monitoring budgetary incomes and expenditures. The findings indicate that the managers of electrical appliance sales businesses are effective in carrying out their management tasks which will help to advance the business towards more profitability and efficient product delivery. This finding is in line with the statement by Kaehler and Grundeiis (2019), that management tasks like motivating, solving conflicts, safeguarding health, and qualifying/developing people are doubtlessly necessary for steering business operations to greater productivity.

Conclusion

The study found that electrical appliance marketers in Enugu State primarily used Facebook, WhatsApp, and Instagram for product marketing. Email marketing resources such as newsletters, transactional marketing, or behavioural marketing for sales, advertising, or customer outreach are not widely used among electrical appliances indicating a lack of familiarity with other social media platforms or limited knowledge of these platforms. However, managers create goals, objectives, and employee schedules, as well as strategies to improve productivity and efficiency. They also ensure compliance with company policies and regulations, train and mentor employees, and monitor budgetary incomes and expenditures. This effective management approach leads to increased profitability and efficient product delivery.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Marketers of electrical appliances should be open to exploring more digital marketing resources as channels to be used to reach out to new and existing customers for better management of their businesses.
2. The state government through the Ministry of Commerce and Industry and other relevant agencies should formulate policies that will facilitate the adoption of e-business for increased use of digital marketing among dealers of electrical appliances and other marketers in the state because of its potential in improving business growth and development.

References

Alexander, L.(2022). *The who, what, why & how of digital marketing*. https://blog.hubspot.com/marketing/what-is-digital-marketing.

American Marketing Association, (2019). *Definition of marketing*. https://www.ama.org/the-definition-of-marketing-what-is-marketing/

Diyana, A.G. (2019). *Understanding of digital advertising in Malaysia: How brand awareness affects consumer purchase decision*. https://www.researchgate.net/publication/project/

Eric, J.O. (2019, September, 17). *Traditional advertising and digital advertising*. https://thisisarray.com/traditional-vs-digital-advertising/

Kaehler, B & Grundeiis, J.(2019). *The concept of management: In search of new definition*. https://www.researchgate.net/publication/326209797

Electrical Contractors Association (2021). *Electrical appliance.* https://www.designingbuildings.co.uk/wiki/Electrical_appliance

Electriveda (2020). *Electric appliances.* .https://www.electricveda.com/book/electric-appliances

Feder, M (2021). *Seven types of digital marketing: What they are and how to start*. https://www.phoenix.edu/blog.

Ghazie, D.A. & Dolah, J. (2018). How digital marketing affects consumer behavior. *Proceedings of the 3rd International Conference on Creative Media, Design and Technology.*https://www.researchgate.net/publication

Griffin, L. (2022). *Social media marketing*. https://www.techtarget.com

Gulati, R., Mayor, A.J. & Nohrian, N. (2017). *Management: An integral approach*. Boston: Cengage Learning.

Herrity, J. (2022, November, 17). *Management: Definition and functions.* https://www.indeed.com/career-advice/career-development/what-is-management

Iddris, F.(2012), Adoption of E-commerce solution in small and medium-sized enterprises in Ghana. *European Journal of Business and Managemen,4(10),48-57.https://iiste.org/Journals/index.php/EJBM/article/view/2217/2436*

Iwuchukwu, U.J. & Uzuagu, A.U. (2020). Information communication and technology skills possessed by small scale entrepreneurs for growth in the electronic world era in Abia State of Nigeria: *Vocational and Technical Education Journal,* 2(1), *209.*

Jeff, P. (2019). *Digital marketing resources*. https://www.bluleadz.com/blog/15-places-to-get-the-best-digital-marketing-resources

Lewis, M. (2022). *What is business management? And why it may be a great choice*. https://online.uc.edu/what-is-business-management.

Membrillo, A.(2021).*Digital marketing*. https://www.cardinaldigitalmarketing.com/ blog/top-9-benefits-of-digital-marketing/

Nnamani, E.C.(2013). Adoption of social media for marketing of products and services among small and medium-scale enterprises owners in Northcentral Nigeria. *Journal of Information Technology, 5*(2). 94-103. https://www.researchgate.net/publication/366066044_Social_Media_Usage_and_Performance_of_Small_and_Medium_Enterprises_in_Nigeria

Numero, U. (2021). *Impact of digital marketing and consumer perception*. https://www.numerounoweb.com/digital-marketing/impact-digital-marketing-consumer-perception/9954/)

Nworgu, B.G. (2015). *Educational research: Basic issues and methodology*. Nsukka, Enugu University Trust Publishers.

Nyekwere, E.O, Okoro, N.M. & Azubuike, C. (2014). An assessment for the use of social media as advertising vehicles in Nigeria: A study of Facebook and Twitter. *New Media and Mass Communication, 21.* 1-9. https://www.iiste.org/Journals/index.php/NMMC/article/view/10621

Papasolomonu, I. & Melanthiou, Y. (2012). Social media: Marketing public relations' new best friend. *Journal of*

Promotion Management, 18(3).319-328. https://DOI: 10.1080/10496491.2012.696458

Ponto, J. (2015). Understanding and evaluating survey research. *Journal of Advance Practitioner in Oncology, 6*(2),168-171. *https://www.researchgate.net*

Pineiro-Otero, T & Martinez-Rolan, X. (2016).*Understanding digital marketing: Basics and actions.* Springer International Publishing Switzerland 2016.

Tay, D. (2023). *Three important types of email marketing*. https://www.getvero.com.

J. of Family and Society Research 2 (2), December 2023, pp. 93 - 107

Effect of Different Processing Methods (Roasting and Shade-Drying) on Fatty Acid Profile of Tumeric (*Curcumin longa*)

Onyeke, N. G[1]., Onodugo, N. G[2] &Idoko C.C[1]
[1]Department of Home Science and Management, University of Nigeria, Nsukka
[2]Department of Nutrition and Dietetics, University of Nigeria, Nsukka

Correspondence: gift.onodugo@unn.edu.ng

Abstract

Temperature has been identified as an important factor affecting the fatty acid composition in food products. The study assessed the effect of roasting and shade-drying on the fatty acid profile of turmeric (*Curcumin longa).* Two kilograms of freshly harvested turmeric were purchased from a local market in Nsukka LGA, Enugu State, Nigeria. Three samples coded A, B and C were used for the study. Samples A and B were subjected to roasting and shade-drying, respectively, while C was untreated and served as a control. Turmeric oil from these samples was extracted and taken to the laboratory for analysis. Standard methods were used for the oil extraction and analysis. Data obtained were analysed statistically using Statistical Product and Service Solution (SPSS) version 22. Analysis of variance (ANOVA) was used to compare means while Turkey HSD-test was used to separate means. Statistical significance was set at $p < 0.05$. The results showed that shade-dried and roasted turmeric had higher ($p < 0.05$) unsaturated fatty acid (2.51 and 2.03 mg), respectively than fresh turmeric (0.53 mg). The total omega-3 fatty acid (1029.93 mg) in the shade-dried and 720.72mg in the roasted samples was higher than that in the fresh sample. The fatty acid profile result revealed that the roasted sample contained the highest amount of oleic acid (43.65 g) while the shade-dried samples had the highest amount (44.14g) of palmitic acid. Therefore, shade-drying and roasting increased the unsaturated fatty acids, polyunsaturated fatty acids (omega-3 and omega-6) and some of the fatty acid profiles of turmeric oil.

Keywords: Roasting, Shade-Drying, Turmeric, Fatty Acid Profile.

Introduction

Globally, there is a rise in the demand for quality oils and fats, and to cope with this increasing demand, it is necessary to utilize some non-conventional sources of fats and oils. Turmeric rhizome is one such source. Turmeric oil is better than other vegetable oils regarding health benefits. However, an increase in temperature during turmeric processing may adversely affect the fatty acid composition as is the case in other food materials. Cortez et al. (2020) showed that heat-related chemical reactions involved in domestic cooking

including drying and roasting may alter or compromise the bioactive compounds such as fatty acids in spices by changing their physical, chemical and nutritional characteristics. Similarly, Sheikh et al. (2010) reported that temperature increase decreased the linoleic acid content of the polar lipid fraction.

Turmeric is a spice of a tropical perennial plant, botanically called *Curcuma longa* and belongs to the same family (Zingiberaceae) as ginger (Amadi et al., 2018). It originated from India and Indonesia but it is cultivated throughout the tropics around the world. Yearly, the production of turmeric ranged between 1.1-1.15 million tons worldwide in which India was the leading contributor with 82% productivity share followed by China (8%), Myanmar (4%), Bangladesh (3%), Nigeria (3%) and 2% by others (Kanungo, 2016; Moghe et al., 2012). According to Nasri et al. (2014), it can be used as a food spice, medicine and for income generation. Turmeric powder is the major constituent of curry powder used in confectionery industries for food seasoning and in the international market as a functional food due to its health-promoting properties. As a spice, it adds flavour and colour to dishes. Turmeric is usually transformed into flour before use. Nwaekpe et al. (2015) reported that it is known as the golden spice of life and is regarded as one of the most essential spices used in culinary all over the world because it gives the desirable yellow-orange colour to curry powder.

Many researchers have shown that turmeric has the potential to protect against non-communicable diseases, such as cardiovascular dysfunction, cancer, and diabetes (Lai & Roy, 2004; Moshiri et al., 2015). Research by Amadi et al. (2018) revealed that turmeric is efficiently used in the treatment of circulatory problems, liver diseases, dermatological disorders and blood purification. It has been shown to reduce inflammation. According to Chandrasekaran et al. (2013), the anti-inflammatory action of turmeric may be correlated with its ability to reduce the number of fibroblasts and the synthesis of collagen and mucopolysaccharides that are involved in the formation of granuloma tissue. In addition, McQuillan (2022) found that turmeric's anti-inflammatory action appears to help improve pains associated with rheumatoid arthritis, post-operative inflammation, Crohn's disease, ulcerative colitis, irritable bowel syndrome, and stomach ulcers. Recent research has identified turmeric as an antioxidant. Mansour-Ghanaei et al. (2019) found that curcumin in turmeric in higher dosages could be efficacious in the treatment of non-alcoholic fatty liver disease.

The medicinal benefits of turmeric may be due to the presence of high light-sensitive curcumin of which about 27-53% is lost during heat processing and in the commonly practised open sun drying method (Geethanjali et al., 2016; Suresh et al., 2017). Curcumin is a small molecular weight polyphenolic compound and lipophilic in nature. It is insoluble in water and ether but soluble in ethanol,

dimethylsulfoxide, and other organic solvents. Nutritionally, turmeric contains 9.42% crude protein, 4.60% crude fibre and 6.85% fat, 0.59% of riboflavin, 0.16% of thiamine, and 2.30% of niacin (Ikpeama et al., 2014). According to Imoru et al. (2018) stated that turmeric rhizome contained 3.44mg/g of vitamin A, 0.32 mg/g of B3, 0.84 mg/g of C and 0.39 mg/g of E. According to Uchechukwu (2020), turmeric contains no cholesterol but, it is rich in antioxidants and dietary fibre. These nutrients perform important specific functions in the body.

Fats are used for energy after they are broken into fatty acids. Nkwocha et al. (2019) defined fatty acids as carboxylic acids with a long aliphatic chain that is either saturated or unsaturated in chemistry, particularly biochemistry. Fatty acids are an integral component of cell membrane phospholipids, with specific functional, metabolic, and signalling roles (Calder, 2015). Omega-3- 3 (ω-3) and omega-6 (ω-6) are two main families of polyunsaturated fatty acids (PUFAs) that are relevant to human health. They are known as essential fatty acids because the human body cannot synthesize them and as such must be supplied from the diet (Luo et al., 2021; Wu et al., 2016; Yin et al., 2016). There are three types of omega-3 fatty acids which include alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) (Judge, 2018; Kang, 2004).

Several studies around the globe have shown that omega-3 fatty acids have anti-inflammatory, antithrombin, anti-heart rhythms, can reduce blood lipid levels, and have vasodilating properties (Adili et al., 2018; Calder, 2012; Holub & Holub, 2004; Massaro et al., 2008). The ω-3 fatty acids are polyunsaturated fatty acids characterized by the presence of a double bond on the third atoms away from the terminal methyl group in their chemical structure. They are long-chain polyunsaturated fatty acids (PUFA) that are found in plants and marine organisms. Alpha-linolenic acid (ALA) is a plant-based essential omega-3 polyunsaturated fatty acid with three double bonds (Blondeau et al., 2015). Su et al. (2018) reported that it constitutes 67% of perilla oil, 55% of linseed oil, 42% of peony oil, 32% of sea buckthorn oil, 20% of Bama hemp oil, 10% of rapeseed oil, 8% in soybean oil, and 50% in grape oil. Currently, the edible oil with the most α-linolenic acid is perilla seed oil (Mukhametov et al., 2022).

The World Health Organization/Food and Agriculture Organization (WHO/FAO) (1994) reported that the total n-3 fatty acid intake may be within the 0.5–2%E range. While the minimum dietary requirement of ALA (>0.5%E) for adults can help to prevent deficiency symptoms, the higher value 2%E (ALA) plus n-3 long-chain polyunsaturated fatty acids (LCPUFA) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) represents the Upper value of Acceptable Macronutrient Distribution Range (AMDR) can range between 0.250 g–2.0 g and may be part of a healthy diet. Whilst ALA may have individual properties in its own right, there is evidence that the n-3 LCPUFA

may contribute to the prevention of CHD and possibly other degenerative diseases of ageing. Omega-6 FAs, on the other hand, are PUFAs that are characterized by the presence of a double bond six atoms away from the terminal methyl group in their chemical structure. WHO/FAO (1994) also estimated an average intake of (EAR) for LA of 2%E and an adequate intake (AI) for LA of 2–3% E. The resulting acceptable range (AMDR) for n-6 fatty acids (LA) intake is 2.5–9%E. Whereas the lower value or AI (2.5–3.5%E) corresponds to the prevention of deficiency symptoms, the higher value as part of a healthy diet contributes to long-term health by lowering LDL and total cholesterol levels and therefore the risk for CHD.

The Food and Agriculture Organization (FAO) (1994) recommendation for essential fatty acid consumption showed that there is no rationale for a specific recommendation for the n-6 to n-3 ratio, or LA to ALA ratio if intakes of n-6 and n-3 fatty acids lie within the recommendation. However, some authors reported that there is a need for a specific ratio of these fatty acids. According to Taha et al. (2014) one of the reasons for the specific ratio of n-6 to n-3, is that a reduction in dietary omega-6 fatty increases the bioavailability of omega-3 polyunsaturated fatty acids in human plasma lipid pools. Simopoulos (2008) showed that decreasing dietary omega-6 fatty acid (i.e. linoleic acid) intake increases the bioavailability of omega-3 fatty acids, which may in turn lower tissue concentrations of the omega-6/omega-3 fatty acid ratio, mitigate the intensity and duration of inflammatory responses and subsequently reduce disease risk.

Recent studies have shown that essential fatty acids are extremely necessary for the growth and development of fetuses and infants, especially for the development of the brain and vision. Thus, women who eat well during pregnancy deposit approximately 2.2 grams of essential fatty acids daily in mother and baby tissues (ChavanGautam et al., 2018; Duttaroy & Basak, 2020; Tressou et al., 2019; Wadhwani et al., 2018). Turmeric contains health-benefiting essential oils such as turmerone, curlone, curumene, cineole, and p-cymene (Nwaekpe et al., 2015) in addition to ω-3 and the omega-6 ω-6 fatty acids. For this reason, it should be consumed adequately to avoid low intakes that would induce essential fatty aciddeficiency. However, Simopoulos (1999) reported that essential fatty acid deficiency is rare in humans, but low intakes are said to contribute to dermatitis, renal hypertension, mitochondrial activity disorders, CVDs, type 2 diabetes, impaired brain development, arthritis, depression, and decreased body resistance to infection.

Turmeric is usually boiled and dried before being utilized. Other conventional processing of turmeric consists of slicing the rhizome, sun drying, roasting as well as grinding. Drying is a critically important step during the processing of turmeric with the main aim being to reduce its moisture content from 70-80% at the time of harvest, to a safe limit of 10% for grinding or 6% for safe storage

(Singh et al., 2010). The various conditions to which turmeric rhizomes are exposed during processing may have a detrimental effect on the nutritional constituents (Emelike, 2020). Thus, this study determined the effect of different processing methods (roasting and shade-drying) on the fatty acid profile of turmeric (*Curcumin longa*).

Objectives of the study: The specific objectives were to:

1. determine the unsaturated fatty acid contents of the fresh, roasted and shade-dried turmeric oil;
2. estimate the quantity of omega-3 and omega-6 fatty acids in the oil extracted from roasted and shade-dried turmeric samples; and
3. determine the effect of roasting and shade-drying on the fatty acid profile of turmeric oil

Materials and Methods

***Study design*:** The study employed a quasi-experimental research design. This design is suitable for the current study because it examined the effect of manipulated independent variables on the dependent variables.

***Materials procurement and preparation*:** Two Kilograms (2 kg) of freshly harvested turmeric were purchased from Ogige market, Nsukka Local Government Area, Enugu State. The sample was taken to the Department of Plant Science and Biotechnology Department, Faculty of Biological Sciences, University of Nigeria Nsukka for identification.

The fresh turmeric was sorted and washed with clean running water and put in the colander to drain the water. The drained turmeric was peeled and cut into smaller sizes to make grinding easy. The sample was divided into three equal portions of 600 g each. Sample A and B were subjected to roasting and shade-drying, respectively while sample C was left untreated and served as the control. Sample A was dried in a hot air conventional oven at 55oC for 60 minutes and B was shad-dried for 5 days. All the samples (A, B and C) were ground differently into a fine powder using a Thomas-Wiley laboratory hammer mill, sieved and packaged in an air-tight transparent plastic container.

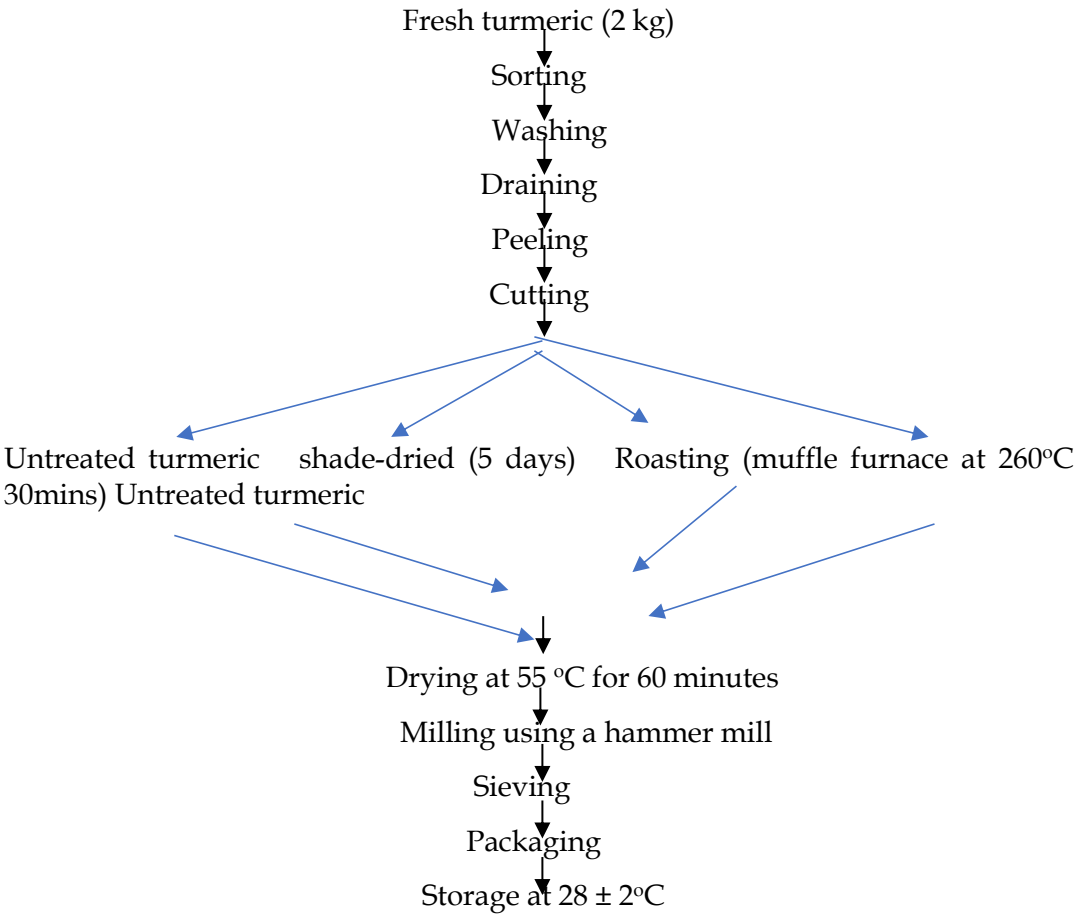

Figure 1: Processing flow chart of turmeric flour

Extraction of turmeric oil
Method

Two kilograms of fresh turmeric were sorted and washed with clean running water and put in a colander to drain the water. The drained turmeric was peeled and cut into smaller sizes for easy grinding. The clean dried turmeric was milled using a Thomas- Wiley laboratory hammer mill into a paste. The paste was dissolved in ethanol using a soxhlet extractor. The oil extracted from the turmeric was packaged inside an airtight container and stored at 28. 2°C as shown in the flow chart below.

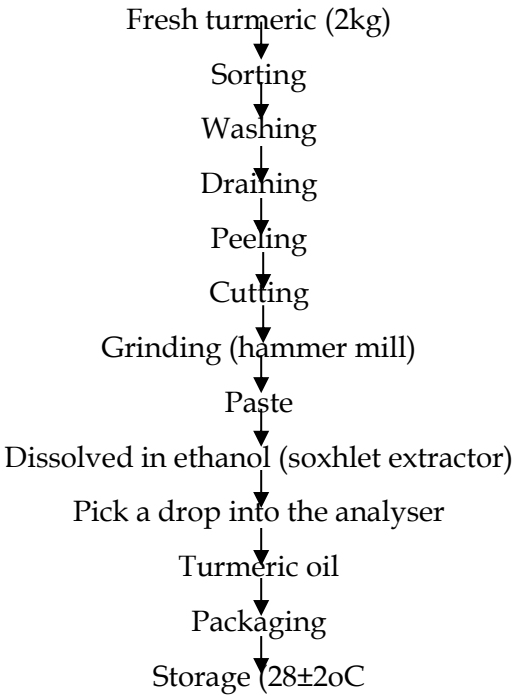

Figure 2: Processing flow chart of turmeric oil

Chemical analysis

Determination of total fat

The total fat content of the turmeric was determined using the Kjeldahl method (AOAC, 2010). A 500 ml capacity round bottom flask was filled with 300 ml petroleum ether and fixed to the soxhlet extractor. Two grams of the sample were placed in a label thimble. The extractor thimble was sealed with cotton wool. The heat was applied to the reflux apparatus for 6 hours. The thimble is then removed with care. The petroleum ether was removed and dried at 105°C for 1 hour in an oven. The flask is then cooled in a desiccator and weighed.

%fat = $weight\ of\ fat/weight\ of\ sample$ X100/1

Determination of fatty acid profile

The fatty acid profile of turmeric was determined using gas chromatography (roasting method). The fresh turmeric is washed with clean water and roasted in a muffle furnace at 260°C for 30 minutes. Turmeric is dried thoroughly and grounded. The sample was passed to a 0.1mm sieve and stored in a cool dry container, 5g of the roasted turmeric sample was measured into the conical flask, and 50 ml of ether was added into a conical flask. The content was thoroughly mixed and allowed to stand for 30 minutes, filtered and kept.

Determination of the fatty acid profile of turmeric using gas chromatography

(shade-drying). The turmeric sample was washed with clean water, spread evenly on a clean sheet and subjected to natural airflow for 4-5 days. When the sample was completely dry, it was ground and passed to a 0.1mm sieve and stored in a cool dry container. Five grams of the grounded sample was measured in a conical flask. Fifty millilitres (50ml) of ether was added, and the content was well shaken and allowed to stand for 30 minutes. It was then filtered and kept.

Determination of omega 3 fatty acid and omega 6 fatty acid

Omega 3 fatty acid and omega 6 fatty acids were determined using different spectrophotometer methods. Methylated turmeric samples were measured at different wavelengths with methanol standard. Omega 3 fatty acid = 520nm. Omega 6 fatty acid = 320nm.

$$weight\ of\ fat/weight\ of\ sample\ \text{X}\ 100/1$$

Statistical analysis

Data obtained were analysed using Statistical Product and Service Solution (SPSS) version 22. Results were presented as mean ± standard deviation. One-way Analysis of Variance (ANOVA) was used to compare the means of variables while the Turkey HSD-test was used to separate means at a 5% probability level ($p<0.05$).

Results

Table 1 presents the unsaturated fatty acid contents of fresh, shade-dried and roasted turmeric per 100 g. Fresh turmeric had significantly ($p < 0.05$) lower unsaturated fatty acid (0.53 g) than the shade-dried and roasted samples. Shade-drying and roasting had comparable amounts of unsaturated fatty acids which were 2.51 ±0.02 and 2.03 ±0.03, respectively.

Table 1: Unsaturated fatty acid contents of fresh, shade-dried and roasted turmeric samples (per 100 g)

Sample	Unsaturated fatty acid (Mean ±SD)
FT	0.53 ±0.03[a]
ST	2.51 ±0.02[b]
RT	2.03 ±0.03[b]

Values are Mean ± Standard deviation (SD) of triplicate determination. Mean values on the same column with different superscripts are significant at $p < 0.05$, FT = fresh turmeric, ST= Shaed-dried turmeric, RT = roasted turmeric

Table 2 shows the omega-3 and omega-6 fatty acids in fresh, shade-dried and roasted turmeric (per 100 g). Shade drying and roasting led to significant ($p < 0.05$) increases in the omega-3 and omega-6 fatty acids compared to the fresh sample.

Table 2: Omega-3 and omega-6 fatty acids on fresh, shade-dried and roasted turmeric (per 100 g)

Name of polyunsaturated fatty acids (mg)	FT	ST	RT

Total omega-3 fatty acid	293.89±4.61[b]	1029.93±0.08[a]	720.72±0.33[a]
Total omega-6 fatty acid	0.31±0.01[b]	0.53±0.01[a]	0.42±0.01[a]

Values are Mean ± Standard deviation (SD) of triplicate determination. Mean values on the same column with different superscripts are significant at p <0.05, FT = fresh turmeric, ST= Shaed-dried turmeric, RT = roasted turmeric

The effect of temperature (shade-drying and roasting) on the fatty acid profile of turmeric oil is shown in Table 3. The myristic acid content of the fresh and roasted samples was statistically ($p < 0.05$) higher (20.17 ±0.01and 28.48 ± 0.07) compared to the shade-dried sample. The fresh turmeric sample had higher (16.13 ± 0.03) unolenic fatty acid than the shade-dried and roasted samples. However, the unoleic fatty acid content of shade-dried (8.17 ± 0.01) and roasted (10.76 ± 0.01) samples was significantly ($p < 0.05$) higher than that of the fresh sample. The shade-dried sample contained more palmitic (44.14 ± 0.03 mg), linoleic (12.18± 0.06) and Eicosadienoic (10.42 ± 0.02) fatty acids than the other samples.

Table 3: Effect of shade-drying and roasting on the fatty acid profile of turmeric oil per (100g)

Fatty acid (mg)	FT	ST	RT
Myristic acid	20.17 ±0.01[b]	3.73 ± 0.04[c]	28.48 ± 0.07[a]
Palmitic acid	6.32±0.01[b]	44.14 ± 0.03[a]	0.00 ± 0.00[c]
Oleic acid	42.15 ± 0.03[a]	31.73 ± 0.06[b]	43.65 ± 0.01[a]
Unoleic acid	2.14 ± 0.03[b]	8.17 ± 0.01[a]	10.76 ± 0.01[a]
Linoleic acid	3.37 ± 0.05[b]	12.18± 0.06[a]	3.96 ± 0.56[b]
Unolenic acid	16.13 ± 0.03[a]	1.85 ± 0.02[b]	10.42 ± o.33[b]
Eicosadienoic acid	3.84 ± 0.03[b]	10.42 ± 0.02[a]	0.55 ± 0.01[c]

Values are Mean ± Standard deviation (SD) of triplicate determination. Mean values on the same column with different superscripts are significant at p <0.05, FT = fresh turmeric, ST= Shaed-dried turmeric, RT = roasted turmeric

Discussion

The fast increase in the demand for quality fats and oils in the world has aroused the interest of researchers to find other non-conventional sources. Hence, the importance of exploring the effect of temperature on the fatty acid content of turmeric oil in the present study as an alternative to other nutritive quality ones already known. In the present study, the amount of unsaturated fatty acids in all the samples was not negligible implying that it may not serve as an alternative to other conventional oil. However, the fresh turmeric oil had significantly lower unsaturated fatty acid than the oil from both the shade-dried and roasted samples. In the same vein, shade-dried and roasted turmeric oil had significantly higher ω-3 and ω-6 fatty acids compared to the fresh sample suggesting that heat treatment favoured these fatty acids in turmeric oil.

This implies that temperature or application of different processing methods like shade-drying and

roasting in this case, provided better oil than oil from the raw turmeric. Unsaturated fats are composed of double bonds which make them liquids at room temperature. They have been found to improve heart health more than saturated fatty acids. Thus, consumption of turmeric oil may help to protect the heart against certain disease conditions. According to Paula et al. (2011), turmeric oil is better than other vegetable oils concerning health benefits.

These observations may be attributable to the effect of heat and the method of extraction on the chemical composition of the spice. Heat-related chemical reactions involved in domestic cooking including drying and roasting have been shown to alter the bioactive compounds such as fatty acids in spices by changing their physical, chemical and nutritional characteristics (Cortez et al., 2020; Sheikh et al., 2010). Additionally, Choi et al. (2014)reported thatcurcuminoids found in turmeric are susceptible to long drying times, high temperatures, extraction, processing, and storage. Omega-6 and ω-3 fatty are essential fatty acids that must be obtained from the diet. However, Weill et al. (2020) reported that it is necessary to strike a balance in the consumption of essential fatty acids to maintain a healthy heart while improving the general physical and mental health of humans.

These fatty acids perform several important functions in the body including but not limited to normal functioning of the brain. It has been found that the brain contains more than 100 billion cells, and ω-3 fatty acids are the main materials that make up these cells (Mukhametov et al., 2022). Calder (2010) reported that they bind to the cell membrane and increase cell membrane fluidity, which is very important for the maintenance of normal brain cells. According to Tanaka et al. (2012), adequate membrane fluidity helps the brain transform and adapt to new information. The anti-inflammatory effect of omega-3 fatty acids can further be used in the treatment of inflammatory diseases. Wyss-Coray and Rogers (2012) found that omega-3 is a precursor to anti-inflammatory hormones and helps relieve inflammation in the brain and other body organs.

The roasted turmeric oil sample had significantly higher myristic fatty acid than the fresh and shade-dried samples. This implies that consumption of roasted turmeric oil may predispose humans to the risk of cardiovascular diseases since it is a saturated fat. Studies by *Mensink (2016) and Schwingshackl et al. (2018) demonstrated that* myristic acid consumption increases the level of low-density lipoprotein (LDL) cholesterol.

The palmitic acid (6.32mg) of the fresh turmeric oils in this study was similar to the study of Paula et al. (2011) who found that three fresh turmeric oils collected in three different regions contained 6.00mg, 5.59mg and 5.73mg of palmitic acid. Significant differences existed in the palmitic and eicosadienoic acids among the three turmeric samples studied. According to Gustone (2011), palmitic acid is the most important and widespread

saturated fatty acid present in animal fats and palm oil and the acid has been for a long time negatively depicted for its putative detrimental health effects, shadowing its multiple crucial physiological activities

The Oleic acid content of the fresh and the roasted oil was statistically comparable to each other while that of the shade-dried sample was significantly lower than the other samples. According to a study by Nollet (2004), oleic acid was lower in all the turmeric oil samples than those in olive oil (55-83Mg) and safflower oil (79.7mg) while the palmitic acid content was comparable to that of safflower oil (5.5-6.5mg). The quantity of oleic acid content of the fresh turmeric oil sample in the present study was similar to those recorded by Paula et al. (2011) which showed that fresh turmeric obtained from three different regions in Bangladesh contained 42.15mg, 43.66mg and 31.73mg of oleic acid. Higher oleic acid contained in the study roasted turmeric oil may help to reduce the raised level of total plasma cholesterol without reducing the high-density lipoprotein (HDL) cholesterol level.

Conclusion

Shade-drying and roasting had comparable and higher amounts of unsaturated, ω-3 and ω-6 fatty acid contents. In terms of the fatty acid profile of turmeric samples, roasting had higher myristic acid, oleic acid and unoleic acid and can be considered the best method because it provides healthier fatty acids (unsaturated fatty acids) than the fresh and shade-dried samples. However, there is a need to strike a balance in the consumption of saturated and unsaturated fatty acids for better overall health.

References

Adili, R., Hawley, M., & Holinstat, M. (2018). Regulation of platelet function and thrombosis by omega-3 and omega-6 polyunsaturated fatty acids. *Prostaglandins & Other Lipid Mediators*, 139, 10-18. http://dx.doi.org/10.1016/j.prostaglandins.2018.09.005.

Amadi, P. O. E., Adiele-Ezekiel, K. N., Ibe, M. N., & Nzeakor, F. C. (2018). Turmeric production, processing and marketing for sustainable agricultural development in Nigeria. *Journal of Community & Communication Research (JCCR)*. ISSN, 2635-3318. www.jccr.org.ng

A.O.A.C (2010). *Official methods analysis* (18th edition*)*. Washington DC, USA, Association of official Analytical Chemists

Calder, P. C. (2012). The role of marine omega-3 (n-3) fatty acids in inflammatory processes, atherosclerosis and plaque stability.*Molecular Nutrition & Food Research, 56*(7), 1073-1080. http://dx.doi.org/10.1002/mnfr.201100710.

Calder, P.C. (2015). Functional roles of fatty acids and their effects on human health. *Journal of Parenteral and Enteral Nutrition,* 39, 18S–32S. https://doi.org/10.1177/0148607115595980

Chandrasekaran, C. V., Sundarajan, K., Edwin, J. R., Gururaja, G. M., Mundkinajeddu, D., & Agarwal, A. (2013). Immune-stimulatory and anti-inflammatory activities of Curcuma longa extract and its polysaccharide fraction. *Pharmacognosy Research*, 5(2),

71–79. https://doi.org/10.4103/0974-8490.110527

Chavan-Gautam, P., Rani, A., & Freeman, D. J. (2018). Distribution of fatty acids and lipids during pregnancy. *Advances in Clinical Chemistry*, 84, 209-239. http://dx.doi.org/10.1016/bs.acc.2017.12.006

Choi, W., Lim, H. W., & Lee, H. Y. (2014). Effect of balanced low-pressure drying of Curcuma longa leaf on skin immune activation activities. *Bio-Medical Materials and Engineering, 24*(6), 2025-2039. http://dx.doi.org/10.3233/BME-141012

Cortez, M.V., Perovic, N.R., Soria, E. A., & Defagó, M. D. (2020). Effect of heat and microwave treatments on phenolic compounds and fatty acids of turmeric (Curcuma longa L.) and saffron (Crocus sativus L.). *Brazilian Journal of Food Technology*, 23, e2019205-e2019212. http://dx.doi.org/10.1590/1981-6723.20519

Duttaroy, A. K., & Basak, S. (2020). Maternal dietary fatty acids and their roles in human placental development. *Prostaglandins, Leukotrienes, and Essential Fatty Acids*, 155, 102080. http://dx.doi.org/10.1016/j.plefa.2020.102080.

Emelike, N.T. (2020). Functional and physicochemical properties of turmeric powder as affected by processing methods. *Asian Food Science Journal*, 19(2), 1-10. https//doi.org/10.9734/afsj/2020/v19i230232

Geethanjali, A., Lalitha, P., & Jannathul, F. (2016). Analysis of curcumin content of turmeric samples from various states of India. *International Journal of Pharma and Chemical Research*, 2(1), 55–62. https://www.ijpacr.com/files/19-01-16/114619012016.pdf

Holub, D. J., & Holub, B. J. (2004). Omega-3 fatty acids from fish oils and cardiovascular disease. *Molecular and Cellular Biochemistry*, 263(1), 217-225. http://dx.doi.org/10.1023/B:MCBI.0000041863.11248.8d.

Ikpeama, A., Onwuka, G. I., & Nwankwo, C. (2014). Nutritional composition of turmeric (Curcuma longa) and its antimicrobial properties. *International Journal of Scientific & Engineering Research*, 5(10), 1085. https://www.researchgate.net/publication/327288405_Nutritional_Composition_of_Turmeric_Curcuma_longa_and_its_Antimicrobial_Properties

Imoru, A., Onibi, G. E., & Osho, I. B. (2018). Nutritional and biochemical compositions of turmeric (Curcuma longa Linn) rhizome powder – A promising animal feed additive.*International Journal of Scientific & Engineering Research*, 9(1), 424-429. https://www.ijser.org/researchpaper/Nutritional-and-Biochemical-Compositions-of-Turmeric-Curcuma-longa-Rhizome-powder-A-Possible-Animal-Feed-Additive.pdf

Judge, M. P. (2018). Omega-3 consumption during pregnancy to support optimal outcomes. *Journal of Obstetric, Gynecologic, and Neonatal Nursing,* 47(3), 429-437. http://dx.doi.org/10.1016/j.jogn.2017.06.004 PMid:28736266.

Kanungo, S. (2016). Trend analysis of turmeric exported from India and associated foreign earnings. *International Journal of Research in Economics and Social Sciences*, 6(11), 99-105. https://euroasiapub.org/wp-content/uploads/2016/12/10ESSNov-4245-1.pdf

Moghe, S.M., Zakiuddin, K.S., & Arajpure, V.G. (2012). Design and development of turmeric polishing machine. *International Journal of Modern Engineering Research*, 2(6), 471-4713. http://dx.doi.org/10.3329/jbau.v16i2.37986

Nkwocha, C. C., Chukwuma, F. I., & Umeakuana, D.C. (2019). Fatty acid profile of some selected locally consumed vegetable oils in Enugu State, Nigeria. *American Journal of Food and Nutrition,* 7(4), 130-135. http://dx.doi.org/10.12691/ajfn-7-4-3

Lai, P. K., & Roy, J. (2004). Antimicrobial and chemopreventive properties of herbs and spices. *Current Medicinal Chemistry*, 11(11), 1451-1460. http://dx.doi.org/10.2174/0929867043365107

Luo, H., Chen, C.-Y., Li, X., Zhang, X., Su, C.-W., Liu, Y., Cao, T., Hao, L., Wang, M., & Kang, J. X. (2021). Increased lipogenesis is critical for self-renewal and growth of breast cancer stem cells: impact of omega-3 fatty acids. *Stem Cells*, 39(12), 1660-1670. http://dx.doi.org/10.1002/stem.3452

Mansour-Ghanaei, F., Pourmasoumi, M., Hadi, A., & Joukar, F. (2019). Efficacy of curcumin/turmeric on liver enzymes in patients with non-alcoholic fatty liver disease: A systematic review of randomized controlled trials. *Integrated Medical Resource*, 8(1), 57-61

Massaro, M., Scoditti, E., Carluccio, M. A., Montinari, M. R., & Caterina, R. (2008). Omega–3 fatty acids, inflammation and angiogenesis: nutrigenomic effects as an explanation for anti-atherogenic and antiinflammatory effects of fish and fish oils. *Journal of Nutrigenetics and Nutrigenomics,* 1(1–2), 4-23. http://dx.doi.org/10.1159/000109871.

McQuillan, S. (2022). *Ginger and turmeric: A dynamic pain-fighting duo*. Https://www.practicalpainmanagement.com/patient/treatments/alternative/gingereturmeric-dynamic-pain-fighting-duo.

Moshiri, M., Vahabzadeh, M., & Hosseinzadeh, H. (2015). Clinical applications of saffron (Crocus sativus) and its constituents: A review. *Drug Research*, 65(6), 287-295. http://dx.doi.org/10.1055/s-0034-1375681

Mukhametov, A., Yerbulekova, M., Aitkhozhayeva, G., Tuyakova, G., & Dautkanova, D. (2022). Effects of ω-3 fatty acids and ratio of ω-3/ω-6 for health promotion and disease prevention. *Food Science and Technology,* 42, e58321, DOI: https://doi.org/10.1590/fst.58321

Nasri, H., Sahinfard, N., Rafieian, M., Rafieian, S., Shirzad, M., & Rafieian-kopaei, M. (2014). Turmeric: A spice with multifunctional medicinal properties. *Journal of HerbMed Pharmacology*, 3(1), 5-8. http://herbmedpharmacol.com/Article/jhp_20150527120508

Nwaekpe, J., Anyaegbulam, H., Okoye, B. C., & Asumugha, G. N. (2015). Promotion of Turmeric for the food /pharmaceutical industry in Nigeria. *American Journal of Experimental Agriculture,* 8 (6), 335-341. https://doi.org/10.9734/AJEA/2015/16517

Paula, B.K., Munshia, M. M. U., Ahmeda, M. N., Sahab, G. C., & Royb, S. K. (2011). The fatty acid composition and properties of oil extracted from fresh rhizomes of turmeric (Curcuma longa Linn.) cultivars of Bangladesh.*Bangladesh Journal of Scientific* and *Industrial* Research, *46*(1), 127-132. http://www.banglajol.info

Sheikh, S.A., Shahnawaz, M., & Baloch, S.K. (2010). Effect of heat stress on fatty acid composition in cotton seedling roots.*Sarhad Journal of Agriculture*, 26(1), 19-24. http://dx.doi.org/10.1007/s13197-010-0057-6

Sheppard, K. W., & Cheatham, C. L. (2018). Omega-6/omega-3 fatty acid intake of children and older adults in the US: dietary intake in comparison to current dietary recommendations and the healthy eating index.*Lipids in Health*

and Disease, 17(1), 1-12. http://dx.doi.org/10.1186/s12944-018-0693-9

Simopoulos, A.P. (1999). Essential fatty acids in health and chronic disease. *American Journal of Clinical Nutrition*. 1999, 70, 560s–569s. http://dx.doi.org/10.1093/ajcn/70.3.560s

Singh, G., Arora, S., & Kumar, S. (2010). Effect of mechanical drying air conditions on quality of turmeric powder. *Journal of Food Science and Technology*, 47, 347- 350. http://dx.doi.org/10.1007/s13197-010-0057-6

Suresh, D., Manjunatha, H., & Srinivasan, K. (2017). Effect of heat processing of spices on the concentrations of their bioactive, principles: turmeric (Curcuma longa), red pepper (Capsicum annuum) and black pepper (Piper nigrum).*Journal of Food Composition and Analysis*, 20(3–4), 346–351.

Taha, A.Y., Cheon, Y., Faurot, K.F., Macintosh, B., Majchrzak-Hong, SF., et al. (2014). Dietary omega-6 fatty acid lowering increases bioavailability of omega-3 polyunsaturated fatty acids in human plasma lipid pools.*Prostaglandins, Leukotrienes & Essential Fatty Acids, 90*: 151-157. http://dx.doi.org/10.1016/j.plefa.2014.02.003

Tressou, J., Buaud, B., Simon, N., Pasteau, S., & Guesnet, P. (2019). Very low inadequate dietary intakes of essential n-3 polyunsaturated fatty acids (PUFA) in pregnant and lactating French women: the INCA2 survey. *Prostaglandins, Leukotrienes, and Essential Fatty Acids,* 140, 3-10. http://dx.doi.org/10.1016/j.plefa.2018.11.007

Uchechukwu, N. U. (2020). Turmeric research in Nigeria: challenges and prospects for food security.*Direct Research Journal of Agriculture and Food Science*, 278-82. https://directresearchpublisher.org/drjafs/files/2020/08/Uchechukwu.-2020.pdf

Wadhwani, N., Patil, V., & Joshi, S. (2018). Maternal long-chain polyunsaturated fatty acid status and pregnancy complications. *Prostaglandins, Leukotrienes, and Essential Fatty Acids,* 136, 143-152. http://dx.doi.org/10.1016/j.plefa.2017.08.002

Wu, K., Gao, X., Shi, B., Chen, S., Zhou, X., Li, Z., Gan, Y., Cui, L., Kang, J., Li, W., & Huang, R. (2016). Enriched endogenous n-3 polyunsaturated fatty acids alleviate cognitive and behavioral deficits in a mice model of Alzheimer's disease. *Neuroscience,333,* 345-355. http://dx.doi.org/10.1016/j.neuroscience.2016.07.038

Yin, X., Yu, X., Zhu, P., Zhang, Y., Zhang, X., Wang, F., Zhang, J., Yan, W., Xi, Y., Wan, J., Kang, J., Zou, Z., & Bu, S. (2016). Endogenously synthesized n-3 fatty acids in fat-1 transgenic mice prevent melanoma progression by increasing E-cadherin expression and inhibiting β-catenin signaling. *Molecular Medicine Reports*, *14*(4), 3476-3484. http://dx.doi.org/10.3892/mmr.2016.5639.

World Health Organization – WHO, Food and Agriculture Organization – FAO. (1994). *Fats and oils in human nutrition: report of a joint expert consultation*. Rome: FAO.

Judge, M. P. (2018). Omega-3 consumption during pregnancy to support optimal outcomes. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 47(3), 429-437. http://dx.doi.org/ 10.1016/ j.jogn.2017.06.004 PMid:28736266.

Kang, J. X. (2004). Achieving balance in the omega-6/omega-3 ratio through nutrigenomics.*World Review of Nutrition and Dietetics*, 93, 92-98. http://dx.doi.org/10.1159/000081253 PMid:15496803

Su, H., Liu, R., Chang, M., Huang, J., Jin, Q., & Wang, X. (2018). Effect of dietary

alpha-linolenic acid on blood inflammatory markers: a systematic review and meta-analysis of randomized controlled trials. *European Journal of Nutrition*, 57(3), 877-891. http://dx.doi. org/10.1007/s00394-017-1386-2 PMid:28275869.

Blondeau, N., Lipsky, R. H., Bourourou, M., Duncan, M. W., Gorelick, P. B., & Marini, A. M. (2015). Alpha-linolenic acid: an omega-3 fatty acid with neuroprotective properties: ready for use in the stroke clinic? *BioMed Research International*, 2015, 519830. http://dx.doi.org/10.1155/2015/519830 PMid:25789320.

Weill, P., Plissonneau, C., Legrand, P., Rioux, V., & Thibault, R. (2020). May omega-3 fatty acid dietary supplementation help reduce severe complications in Covid-19 patients? *Biochimie*, 179, 275-280. http://dx.doi.org/10.1016/j.biochi.2020.09.003

Wyss-Coray, T., & Rogers, J. (2012). Inflammation in Alzheimer disease: a brief review of the basic science and clinical literature. *Cold Spring Harbor Perspectives in Medicine*, 2(1), a006346. http://dx.doi.org/10.1101

Mukhametov, A., Yerbulekova, M., Aitkhozhayeva, G., Tuyakova, G., & Dautkanov D. (2022). Effects of ω-3 fatty acids and ratio of ω-3/ω-6 for health promotion and disease prevention. *Food Science and Technology, 42*, e58321, https://doi.org/10.1590/fst.58321

Calder, P. C. (2010). Omega-3 fatty acids and inflammatory processes. *Nutrients*, 2(3), 355-374. http://dx.doi.org/10.3390/nu2030355 PMid:22254027.

Tanaka, K., Farooqui, A. A., Siddiqi, N. J., Alhomida, A. S., & Ong, W. (2012). Effects of docosahexaenoic acid on neurotransmission. *Biomolecules & Therapeutics*, 20(2), 152-157. http://dx.doi.org/10.4062/biomolther.2012.20.2.152 PMid:24116288

Mensink, Ronald P. (2016). Effects of saturated fatty acids on serum lipids and lipoproteins: a systematic review and regression analysis(PDF). *World Health Organization*.

Schwingshackl L, Bogensberger B, Benčič A, Knüppel S, Boeing H, Hoffmann G (2018). Effects of oils and solid fats on blood lipids: a systematic review and network meta-analysis. *Journal of Lipid Research 59 (9): 1771–1782.* https://dx.doi.org/10.1194/jlr.P085522. PMID 30006369.

Nollet L. M. L. (2004). *Hand book of food analysis, physical characterization and nutrient analysis* (Food Science and Technology) 2nd Ed. Vol-1. Marcel Dekker Inc. Publisher, pp 221-274

FAO (1994). Experts' recommendations on fats and oils in human nutrition. *Food and Nutrition Paper,* No. 57. Retrieved from 11th August, 2023 from https://www.fao.org/3/T4660t/t4660t02.htm

Simopoulos, A.P. (2008*).* The importance of the omega-6/omega-3 fatty acid ratio in cardiovascular disease and other chronic diseases. *Experimental Biology and Med*icine *233*(6):674-88. https://dx.doi.org/10.3181/0711-MR-311.

Gustone A. (2011). *Medicinal Plants of Bangladesh: Chemical constituents and uses*. 2nd Ed. (Revised and Enlarged). Asiatic Society of Bangladesh, old Nimtali, Dhaka pp 196-197.

Knowledge and Prevalence of Anaemia in Pregnancy among Pregnant Women in Nkanu-West Local Government Area, Enugu State

Ugbelu J. E.
Department of Human Kinetics and Health Education
University of Nigeria, Nsukka

Email: jacinta.ugbelu@unn.edu.ng

Abstract

This study determined the knowledge and prevalence of anaemia in pregnancy among pregnant women in the Nkanu-west local government area, Enugu State. Three research questions and one hypothesis guided the study. The study adopted a descriptive cross-sectional survey. A sample of 320 pregnant women was selected through a multi-stage sampling technique. Semi-structured questionnaires and blood test measurements (haemoglobin level estimation) were used for data collection. A reliability index of .78 of the spilt-half method result was established using the Spearman-Brown test. Data analyses were performed with SPSS, version 23. Frequency and percentages were used to answer research objectives 1-3 while Chi-square analysis was used to test the hypothesis at a .05 level of significance. The study found a 55.0% prevalence of mild anaemia, 26.6% moderate anaemia, and 1.20% severe anaemia among the respondents. Also, the result indicated that 14.6% had poor knowledge, 50.0% had average knowledge and 35.3% had high knowledge of anaemia in pregnancy. The chi-square test showed that occupation and parity had a significant relationship with the level of knowledge of anaemia among the women ($p < .05$). It was concluded that anaemia was prevalent among pregnant women and knowledge of anaemia was moderate which can have adverse effects on the fetal and maternal outcome. An intensified sensitization and enlightenment of pregnant women by the health care workers and health educators on the causes of anaemia, treatment and necessary precautions to prevent anaemia in pregnancy was recommended.

Keywords: Anaemia, Pregnancy, Prevalence, Knowledge of Anaemia, Pregnant Women.

Introduction

Anaemia is a public health problem globally affecting both the developed and developing countries. Anaemia can affect anybody but becomes more serious in pregnancy due to the feto-maternal conditions involved. Anaemia in pregnancy was stated to be 51per cent (Melku, et al., 2014). Sub-Saharan Africa is the most affected region with a prevalence of 57% of pregnant women being anaemic, which corresponds to about 17.2 million affected women with severe consequences for human health as well as social and economic development (Melku et al., 2014). Anaemia is defined as a condition in which the number of

red blood cells or the haemoglobin (HB) concentration within the blood is lower than normal (Musya et al., 2019). Anaemia occurs at all stages of the lifecycle but is more prevalent among pregnant women due to their physiological state of health (Abriha et al., 2014). Anaemia in pregnancy is defined as a condition where there is less than 11g/dl of HB concentration in the blood of a pregnant woman, which decreases the oxygen-carrying capacity of the blood to the body tissues (WHO 2016, Onoge, 2019). WHO (2016) further categorized anaemia in pregnancy thus: mild anaemia is HB level 9-10.9g/dl, moderate anaemia is HB level 7-8g/dl and severe anaemia is HB level less than 7g/dl. HB is a driving force for tissue oxygenation and a reduction below acceptable levels can be detrimental to both the fetus and the mother (Olatunbosun, et al., 2014). Anaemia is one of the most common nutritional deficiency disorders affecting pregnant women in developing countries with adverse outcomes for both the fetus and mother. This can result in complications such as preterm birth, low birth weight, fetal abnormality (neural tube defect), stillbirth and even maternal death.

The prevalence of anaemia among pregnant women differs depending on the socio-economic status of the country. Studies conducted in Asian countries showed that the prevalence of anaemia among pregnant women ranged from 18.1% to 90% (Chanya et al., 2022; Anuradha et al., 2021; Adizam et al., 2018). In Africa, studies by Wemakor (2019), Aboud et al., (2019) and Mulugeta et al., (2014) showed a prevalence of 16.6-50.8%. Also, studies carried out in Nigeria among pregnant mothers by Sholeye et al. (2017) and Dim et al. (2015) indicated the prevalence of anaemia ranging from 32.5-32.8%. The pregnancy outcome depends on the health status of the pregnant woman, prevailing health problems and other factors including anaemia. The more severe the anaemia in pregnant women, the more the adverse effect on pregnancy outcome. The prevalence of anaemia among pregnant women may be attributed to the level of knowledge of the concept, causes and prevention of anaemia.

Knowledge is the prerequisite to life's existence. Knowledge of anaemia is essential to pregnant women to avert its adverse effects on them and their unborn babies. Knowledge of anaemia includes knowing the causes, signs and symptoms, prevention and treatment. However, this study focused only on the knowledge of concepts and causes of anaemia in pregnancy. Previous researchers, Appiah et al., (2020) in Ghana reported that only (13.5%) of pregnant women had high knowledge of anaemia, while 58.4% and 28.1% had moderate and low knowledge, respectively. Other researchers, Duko et al., (2017) in Ethiopia and Yesefu, et al., (2013) in Lagos, Nigeria reported that about 44.3% and 95% of respondents had comprehensive awareness of anaemia. Aboud, et al., (2019) reported poor knowledge of iron deficiency anaemia among the majority of respondents. Another researcher Adzam et al., (2018) in Putrajaya revealed that 55.7%of pregnant women had high knowledge of anaemia during

pregnancy while 28.6% had moderate knowledge followed by 15.7% with low knowledge score. Ademuyiwa et al., (2022) in Calabar, Nigeria and Balasubranian et al., (2016) in India studies showed that (77.8%, and 76.5%) of the respondents have heard of anaemia. Ademuyiwa et al., (2022) went further to report that (42.2%) of them could correctly define anaemia, and (71.7%) of them could correctly identify different causes of anaemia. Dwumfour-Asare and Kwapong (2013) in Ghana results showed that the easily known cause of anaemia is poor diet (63%), followed by malaria (26%), worms (5%), and others (6%). These studies were conducted in different countries including Nigeria, but none was done among antenatal attendees in Nkanu-west LGA, Enugu State. Knowledge of anaemia among pregnant women may be linked with some socio-demographic factors.

Certain socio-demographic factors such as age, level of education, marital status, occupation and parity are likely to influence the knowledge of anaemia among pregnant women. Previous researchersAnuradha et al., (2021), Nokethonu et al., (2019) in Sikkim, India, Adznam et al., (2018) and Balasubranian et al., (2016) revealed that the educational qualification of the subjects was significantly related to knowledge of anaemia. Ademuyiwa et al., (2020), Ekwere and Ekanem (2015), Dwumfour-Asare and Kwapong, (2013), Ghimire and Pandey (2013) and Sigh et al., (2013) revealed significant associations between occupational status and knowledge of anaemia while Adznam et al., (2018) indicated that knowledge score was significantly associated with the number of children ($p < 0.01$).

Anaemia can affect anybody including adults and children but is more serious in pregnant women. The pregnant women are expected to register for antenatal care where they can gain knowledge on the causes and prevention of anaemia in Nigeria. Previous studies indicated that anaemia is prevalent among pregnant women (Chanya et al, 2022 Sikkim India and Anuradha et al,2021) in West Bengal. Therefore, this study assessed the knowledge and prevalence of anaemia among antenatal attendees in Nkanu-west Local Government Area (LGA) of Enugu State.

Objectives of the Study: Specifically, the study determined the:

1. level of knowledge of anaemia among pregnant women in Nkanu-west LGA, Enugu State;
2. prevalence of anaemia among the respondents;
3. determine the relationship between the level of knowledge of anaemia and the demographic characteristics of the respondents.

Hypothesis: The level of knowledge of anaemia will not be significantly associated with the demographic characteristics (age, level of education, marital status, occupation and parity) of the pregnant women

Materials/Methods

Study Design: This study adopted a cross-sectional survey and correlational designs in carrying out the study. The

cross-sectional design is suitable to describe the events that occur at a given time among a given population while the correlational design investigates the relationship among existing variables.

***Study Population*:** The population of the study consisted of all1200 pregnant women attending antenatal clinics in 20 primary healthcare centres in Nkanu-west L.G.A, Enugu State between January-June, 2022 (Primary Health Care Department, Nkanu-west, LGA, 2022).

***Sample Size and Sampling Technique*:** The sample size for the study was 330 pregnant mothers selected in multiple stages.In Stage 1, the Yamane (1967) formula was used to calculate the sample size which gave a sample size of 300. Ten percent (10%) attrition of 30 was added giving a total of 330 pregnant women. Stage 2 involves a simple random sampling of 10 (50%) out of the 20 primary healthcare centres in the LGA. This implies that 10 primary health centres were selected, one each from the 10 communities that make up the LGA. Stage 3 involved the use of a convenient sampling technique to select 33 mothers from each of the selected health centres giving a total of 330.

Data Collection Instrument: Two instruments were used for data collection. First was the Sysmex Hematology Analyzer machine (Sysmex Europe GmbH). This was used for haemoglobin estimation to determine the proportion of antenatal mothers suffering from anaemia. The second instrument is the pre-validated researcher-structured questionnaire titled Anaemia in Pregnancy Knowledge among Antenatal Attendees "(APKAAQ)". The APKAAQ was divided into two sections; A-B. Section A contain 5 items on the socio-demographic characteristics of the respondents, such as age, level of education, marital status, occupation and parity. Section B consisted of 10 items on knowledge of anaemia which were multiple-choice questions. The respondents were required to select only one option as it applies to any of the statements.

***Validity and Reliability*:** The questionnaire was validated by three experts from the Department of Human Kinetics and Health Education. Their inputs were used to modify the instrument to produce the final copy for data collection. To determine the reliability of the instrument of the study, 20 copies of the instrument were administered to pregnant mothers attending antenatal in Nkanu-east LGA. Using the data collected, the Spearman-Brown test of internal consistency was used, and that gave the reliability coefficient index of .78**.**

Study Approval and Informed Consent: A formal documented research approval letter (Ref. No. MH/MSD/REC23/373) was obtained from the Primary Healthcare Board Nkanu-west LGA. The letter was presented to the Officer-in-charge (OIC) of each health facility. Also, the antenatal mothers gave oral consent to participate after explaining the purpose of the study. They were assured that their responses would be treated with the utmost confidentiality and would be used only for academic research.

Data Collection Procedure: The researcher was assisted by one research assistant and one laboratory technician for each health facility who were briefed on the modalities of data collection. The laboratory technician collected the blood and took it to the laboratory for haemoglobin level analysis. Three hundred and thirty copies of the questionnaire were further administered to the respondents by the researcher and research assistants. The completed copies of the questionnaire were collected on the spot to ensure a high return rate. Out of the 330 copies of the questionnaire administered, 320 were properly filled which gave a rate of 96.9% viable copies used for data analysis.

***Data Analysis*:** The completed copies of the instrument were sorted and analysed. Data analysis was conducted using IBM SPSS Statistics (version 22). Research questions were answered using frequencies and percentages while the null hypothesis was tested using Chi-square statistics at a 0.05 level of significance. Research objective 1 was analyzed based on the WHO (2016)'s classification. Mild anaemia was established at HB level 9-10.9g/dl, moderate anaemia was at HB level 7-8g/dl while severe anaemia was at HB level less than 7g/dl. Research objectives 2 and 3 were analyzed using frequencies and percentages. In determining the level of knowledge of anaemia, Okafor (1997) guidelines were adopted. By this guideline, total scores below 0-39% were interpreted as low knowledge; 40-69% was considered moderate knowledge while 70% and above was considered high knowledge.

Results

The respondents were mostly (69.3%) between 15 -23 years of age. A few (12.8%) of them had no formal education, 17.8% had a maximum of primary education, 47.5% had secondary education and 21.8% had tertiary education. A greater proportion (66.5%) of the mothers were married, 7.81% were single, 14.37% were widowed and 11.56% were separated/divorced. Some (23.43%) of the mothers were farmers, 25.62% were civil servants, 14.06% were housewives, and 36.87% were traders. As regards parity, 15.31% had 0-1 children, 42.18% had 2-3 children, 29.68% had 4-5 children, and 12.81% had 6 or more children.

Prevalence of anaemia among the respondents.

The result in Table 1 indicates that the overall prevalence of anaemia was 82.8%. The prevalence of mild anaemia was 55.0%, 26.6% moderate anaemia, and 1.20% severe anaemia among the respondents.

Table 1. Prevalence of anaemia among the participants (n = 320)

Levels of Anaemia	f	%
No anaemia	55	17.20
Overall prevalence	265	82.80

Severity of anaemia		
Mild anaemia	176	55.00
Moderate anaemia	85	26.60
Severe anaemia	4	1.20

The result in Table 2 shows that overall, knowledge of anaemia among pregnant women was moderate (44.2%). The result also shows that 34.0% indicated that anaemia in pregnancy is caused by not eating foods containing meats and fish, not eating green leafy vegetables (45.6%) and not eating whole grain meals such as beans and cowpeas (49.3%). The result further shows that 51.2% had heard about anaemia and 33.7% got the correct definition of anaemia.

Table 2. Knowledge of anaemia in pregnancy among the respondents

Anaemia in pregnancy is caused by any of the following:	Correct responses F (%)	Incorrect responses F (%)
Ever heard of anaemia (shortage of blood) in pregnancy?	164(51.2)	156(48.7)
A correct definition of anaemia in pregnancy is HB less than 11g/dl	108(33.7)	212(66.2)
Anaemia is caused by not eating foods containing meats and fish.	109(34.0)	211(65.9)
Lack of green leafy vegetables and fruits in the foods.	146(45.6)	174(54.3)
Repeated malaria infection caused by mosquito bites.	124(38.7)	196(61.2)
Repeated pregnancy at short intervals of less than 2 years.	112(35.0)	208(65)
Not eating whole grain meals such as beans, akidi, (local beans),okpa (cowpeas).	158(49.3)	162(50.6)
Not taking antenatal drugs (folic acid and fersolate tablets) during pregnancy.	181(56.5)	139(43.3)
Not sleeping under insecticide-treated mosquito nets can be exposed to malaria infection.	175(54.6)	145(45.3)
Overall %	**44.2**	**55.6**

Key: 0-39% low knowledge, 40-69% = moderate knowledge, while 70% and above = high knowledge.

The result in Fig 1 shows that half (50.0%) of the pregnant mothers had moderate knowledge, 35.3% had high knowledge and only 14.6% had low knowledge of anaemia.

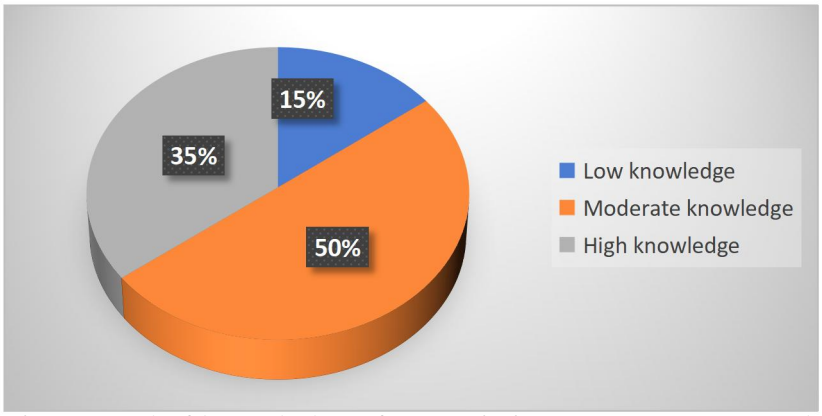

Fig 1. Level of knowledge of anaemia in pregnancy among the respondents

Relationship between knowledge of anaemia and demographic characteristics of the respondents

The result in Table 3 shows that occupation and parity of the pregnant mothers had a significant relationship ($p < 0.05$) with their level of knowledge of anaemia in pregnancy. A greater proportion (73.1%) of the civil servants had a high knowledge of anaemia compared to other occupation groups. Women who have had more than one child showed a higher level of knowledge than those who had one or no child. Age, level of education and marital status had no significant relationship($p > 0.05$) with knowledge of anaemia, though older women (> 23 years), women with tertiary education and single mothers showed higher knowledge of anaemia than their counterparts. The study hypothesis was therefore partly upheld.

Table 3. Relationship between level of knowledge of anaemia in pregnancy and demographic characteristics of the respondents

Socio-demographic variables	Low knowledge (%)	Moderate knowledge(%)	High knowledge(%)	x^2	P-value
Age(years)					
15-23	18(18.5)	52(53.6)	27(27.8)		
24-32	17(13.6)	58(46.4)	50(40.0)		
33-41	9(11.5)	36(46.1)	33(42.3)	6.254	.395
42 and above	2(10.0)	12(60.0)	6(30.0)		
Level of education					
No formal	9(21.9)	18(43.9)	14(34.1)		
Primary	8(14.0)	32(56.1)	17(29.8)		
Secondary	22(14.4)	74(48.6)	56(36.8)	3.398	.758
Tertiary	8(11.4)	32(45.7)	30(42.8)		
Marital status					
Married	44(20.7)	92(43.3)	76(35.8)		
Single	8(32.0)	10(40.0)	7(28.0)		

Widowed	16(34.7)	20(43.4)	12(20.6)	3.787	.151
Separated/divorced	12(32.4)	15(40.5)	10(27.0)		
Occupation					
Farming	12(16.0)	28(37.3)	35(46.6)		
Civil servants	12(14.6)	10(12.1)	60(73.1)		
Housewives	15(33.3)	17(37.7)	13(28.8)	7.890	.042*
Trading	21(17.7)	69(58.4)	28(23.7)		
Parity					
0-1 child	15(30.6)	18(36.7)	16(32.6)		
2-3 Children	30(22.2)	79(58.5)	26(19.2)	6.251	.012*
4-5 Children	24(25.2)	50(52.6)	21(22.1)		
6 children and above	11(26.8)	16(39.0)	14(34.1)		

* values are significant at $p < 0.05$

Discussion

The result of the study indicated a very high (82.8%) prevalence of anaemia mostly ranging from mild (55.0%) to moderate (26.6%)levels. Only a few (1.20%)had severe anaemia, and 17.2% had no anaemia among the respondents. The reason for the great proportion of mild to moderate anaemia might be as a result of pregnant women not attending antenatal regularly, attending late when the nurses/midwives might have finished health talks regarding healthy nutrition in pregnancy or mothers not complying with the health talks given. However, the small proportion of severe anaemia observed may be attributed to the efforts of the professionally trained midwives in the ante-natal clinics in providing adequate nutrition knowledge to pregnant women. It could also be partly due to the adequate fruits and vegetables produced in the study area. The findings of this study disagree with the findings of Chanya et al., (2022) in Sikkim India which reported 73.5% mild anaemia, 26.5% moderate anaemia, and no severe anaemia among pregnant women. Wemkor (2019) in Northern Ghana reported 18.1% mild, 90% moderate and 50.8% severe anaemia. Mulugeta et al. (2014) also reported 6.0% mild, 30.0% moderate and 64.0% severe anaemia in Northern Ethiopia. The differences may be due to the location of the study as the reviewed studies were conducted in other countries with different backgrounds from Nigeria. Nigeria has a variety of nutritious diets which may enhance the haemoglobin status of pregnant women.

The result showed that the pregnant women generally had a good knowledge of anaemia in pregnancy; about a third (35.3%)of the respondents had high knowledge, half (50.0%) of them had moderate knowledge, while only a few (14.6%) had a low level of knowledge of anaemia in pregnancy. However, this finding indicates that the knowledge was mostly at a moderate level, suggesting that there is still much room for improvement, This finding is in agreement with studies of Adzam et al., (2018) in Putrajaya and

Duko et al., (2017) in South Ethiopia which also reported moderate knowledge of anaemia respectively among the pregnant women. The similarity may be that pregnant women attend antenatal clinics where they are counselled on the causes and prevention of anaemia in pregnancy. The finding of the study was at variance with the findings of Yesefu, et al., (2013) in Lagos State Nigeria and Balasubranian et al. (2016) in Tamil Nadu, India which reported a high level of knowledge (44.3% and 76.5%) among the participants. The differences in the findings may be linked to the antenatal attendance of the pregnant women and the ability of the health care providers to educate the pregnant women on nutritional requirements during pregnancy. The result further reports that 51.2%, 45.6% and 49.3% indicated that anaemia in pregnancy is caused by not eating foods containing meats and fish, not eating green leafy vegetables and not eating whole grain meals such as beans and cowpeas. The result concurs with the findings of Dwumfour-Asare and Kwapong (2013) at Brosankro, Ghana who reported that the easily known cause of anaemia is poor diet (63%). The result further reports that 51.2% and 33.7% had heard about anaemia and got the correct definition of anaemia which is in congruence with the findings of Ademuyiwa et al., (2022) at Calabar, Nigeria study that showed that (77.8%, 44.2%, and 71.7%) had ever heard of anaemia, could correctly define anaemia and correctly identified the correct causes of anaemia. This may be due to organized health talk normally delivered by the health care providers during antenatal care services.

Further findings of the study showed that there was a significant relationship between the level of knowledge of anaemia in pregnancy with the occupation and parity among pregnant mothers. The study hypothesis was therefore partly upheld. Mothers who were civil servants had a high knowledge of anaemia compared to other occupation groups. This might be because women in civil service are more likely to be more enlightened in nutrition during pregnancy than traders and farmers. Additionally, women who have had more than one child showed a higher level of knowledge than those who had one or no child. Having more children entails having more experience with pregnancy and participation in nutrition education in ante-natal clinics. This might enhance their knowledge of anaemia during pregnancy. This is in support of the previous studies by Ademuyiwa et al., (2020) in Nigeria, Adznam et al., (2018) study at Putrajaya, Ekwere and Ekanem (2015) in Nigeria, Dwumfour-Asare and Kwapong, (2013) at Ghana and Sigh et al., (2013) at sub-Sahara Africa which revealed significant associations between occupational status, parity and knowledge of anaemia ($p < 0.01$). The similarities between the results of the reviewed studies and the present study can be explained that all the studies were conducted in Africa among pregnant mothers that may have gained some knowledge about anaemia during their regular antenatal and postnatal visits. The finding

further showed that there was no significant relationship in the level of knowledge of anaemia in pregnancy among pregnant mothers based on age, level of education and marital status ($p > .05$). This contradicts the findings of previous researchers: Anuradha et al., (2021) at Putrajaya, Nokethonu et al., (2019) in Sikkim, India, Adznam et al., (2018) at West Bengal and Balasubranian et al., (2016) at India which revealed that age, educational qualification and marital status of the subjects was significantly related to knowledge of anaemia ($P < 0.05$). The differences between the results of the reviewed studies and the present study might be attributed to the different areas of the studies. The reviewed studies were conducted in other countries with different economic and social development from Nigeria.The result of the study further.

Conclusion

Anaemia is a public health problem resulting in complications in pregnancy and contributes to fetal and maternal mortality. This study showed that anaemia was prevalent among the pregnant women attending antenatal clinics in Nkanu-west LGA mostly at mild-to-moderate levels. Severe anaemia was observed among a few women attending ante-natal clinics and this suggests that more efforts are needed to eradicate anaemia among pregnant women especially those in rural areas. Pregnant women in the study area generally had a good knowledge of anaemia in pregnancy which was associated with occupation and parity of the women. Pregnant women who are civil servants and those who have more than one child showed a higher level of knowledge of anaemia in pregnancy compared to their counterparts. Exposure to opportunities to acquire nutrition education is very crucial in equipping pregnant women with knowledge of anaemia and consequently might help to lower the prevalence of anaemia among pregnant women.

Recommendations

The following recommendations were made based on the findings of the study.

1. The study recommended intensified sensitization and enlightenment of pregnant women by the health care workers and health educators on the causes of anaemia, treatment and necessary precautions to prevent anaemia in pregnancy.
2. Pregnant women should also be encouraged by health care providers to cultivate vegetables and seasonal fruits around their residences to ensure regular intake of fruits and vegetables.
3. Ministry of Health, Chief Medical Directors, and Officers in Charge of the health facilities should subsidize the cost of antenatal care services to encourage pregnant women to access the antenatal care services.

References

Aboud, S., Sayed, H. & Ibrahim, H. (2019). Knowledge, attitude and practice regarding prevention of iron deficiency anaemia among pregnant women in Tabuk region, Saudi Arabia.

International Journal of Pharmaceutical Resources and Allied Sciences. 8:87-97. www.ijpras.com

Abriha, A., Yesuf, E.& Wassie, M. (2014). Prevalence and associated factors of anaemia among pregnant women of Mekelle Town: A cross sectional study. *British Medical Council Resources.* 7:888. https://doi.org/10.1186/1756-0500-7-

Ademuyiwa, I.Y., Ayamolowo, S.J., Oginni, M.O., & Akinbode, M.O. (2020). Awareness and prevention of anaemia among pregnant women attending antenatal clinic at a University Teaching Hospital in Nigeria. *Calabar Journal of Health Sciences,* 4(1):20-6. DOI:10.25259/cjhs-22-2020

Adznam, S.N., Sedek, R. & Kasim, Z. M. (2018). Assessment of knowledge level on anaemia among pregnant women in Putrajaya, Malaysia. *NASA/ADS;* 1940:1 id.020104, DOI: 10.1063/1.5028019

Ali, S. A., Khan, U. S. & Feroz, A. S. (2020). Prevalence and determinants of anaemia among women of reproductive age in developing countries. *Journal of the College of Physicians and Surgeons – Pakistan* JCPSP 30(2), 177-186. https:// ecommons.aku.edu/pakistan_fhs_mc_ chs_chs/816

Anuradha, S., Moumita, A., Jyoti, P. P. Sonal, K. & Tirthankar, S. (2021). A study on anaemia and its risk factors among pregnant women attending antenatal clinic of a rural medical college of West Bengal. *Family Medical Primary Care,* 10(3): 1327–1331.Doi: 10.4103/jfmpc.jfmpc_1588_20.

Appiah**, K.**,Nkuah, D.& Bonchel,D.A. (2020). Knowledge of and adherence to anaemia prevention strategies among pregnant women attending antenatal care facilities in Juaboso District in Western-North Region, Ghana. *Journal of Pregnancy;* https://doi.org/10.1155/ 2020/2139892 PMCID:PMC7416296/PMID: 32802508 Article ID 2139892

Balasubranian, T. Avravazhi, M.& Sampath, S.D. (2016). Awareness of anaemia among pregnant women and impact of demographic factors on their haemoglobin status, Tamil Nadu, India. *International Science Study*. 3(12):303-305. Dio: 10.17354/ijes/2016/

Chanya, N., Gurung, S., & Tamang, S. (2022). A cross-sectional study on prevalence of anaemia and its predictors among pregnant women attending antenatal outpatient clinic at central referral hospital, Sikkin, India. *National Journal of Physiology and Pharmacology,* 12(12):2138-2143. Doi: 5455/njppp.2022.12.05202202212052022

Dim, B.C., Ugwu, E., Dim, N.,& Anyaehie, U. (2015). Haematocrit, anaemia, and arm preference for blood sample collection: A cross-sectional study of pregnant women in Enugu, South-Eastern, Nigeria. *Annual Medical Health Science Resources*. 5(1): 36-40. www.amhsr.org

Duko, B., Tadesse, B., Gebre, M.,& Teshome, T.(2017). Awareness of anaemia and associated factors among pregnant women attending antenatal care, South Ethiopia. *Journal of Women's Health Care*, 6: 409, doi: 10.4172/2167-0420. 1000409

Dwumfour-Asare, B.& Kwapong, M. A. (2013). Anaemia awareness, belief and practices among pregnant women: A baseline assessment at Brosankro community in Ghana. *Journal of National Sciences Research.* 3(15): 1-12. https://www.researchgate.net/public ation/259493929

Ekwere,T. A. & Ekanem, A. M. (2015). "Maternal knowledge, food restriction and prevention strategies related to anaemia in pregnancy: a cross-sectional study, Akwa-Ibom. Nigeria." *International Journal of Community Medicine and Public Health,* 2(3); 331–338.

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph2015429

Ghimire, N. & Pandey, N. (2013). "Knowledge and practice of mothers regarding the prevention of anaemia during pregnancy, in teaching hospital, Kathmandu". Journal *of Chitwan Medical College*, 3(3); 14–15. DOI: http://dx.doi.org/10.3126/jcmc.v3i3.8631

Melku, M., Addis, Z., Alm, M. & Enawgaw, B. (2014). Prevalence and predictors of maternal anaemia during pregnancy in Gondar, Northwest Ethiopia: An institutional based cross-sectional study. *Anaemia.* Article ID 108593, 1-9, https://doi.org/10.1155/2014/108593

Msuya, S. E., Hussein, T. E., Uriyo, J., Sam, N. & Stray-Pedersen, B. (2018), "Anaemia among pregnant women in northern Nigeria: *prevalence, risk factors and effect on perinatal out-comes.," NigeriaJournal of Health Research*, 13(1); 33–39. https://doi.org/10.1155/2018/1846280

Mulugeta, M., Zelalem, A., Meseret, A., & Bamlaku, E. (2014). Prevalence and predictors of maternal anaemia during pregnancy in Gondar, Northwest Ethiopia: an institutional based cross-Ssectional study*, Anaemia*. 1-9, Article ID 108593, http://dx.doi.org/10.1155/2014/108593

Nokethonu, C., Sujata, G. & Sangay, T. (2019). A cross-sectional study on prevalence of anaemia and its predictors among pregnant women attending antenatal outpatient clinic at central referral hospital, Sikkim India. *National Journal of Physiology, Pharmacy and Pharmacology,* 12(12), 2138-2143. Doi: 10.5455/njppp.2022.12.0520 2202212052022

Okafor, A. C. (1977). Data analysis for health professionals: a step-by-step guide. Ibadan, Nigeria.

Olatunbosun, A., Olujimi, A., Abasiattai, E., Bassey, R., James, G. & Anyiekere, M. (2014). Prevalence of anaemia among pregnant women at booking in the University of Uyo teaching hospital, Uyo, Nigeria. *Biomedical Resource International.* 2014:849080. Doi: 10.1155/2014/849080

Ononge, S., Campbell, O. & Mirembe, F. (2019). Haemoglobin status and predictors of anaemia among pregnant women in Mpigi Uganda. *British Medical Council,* 7(1); 712. DOI: 10.1186/1756-0500-7-712

Sholeye, O., Animasahun, V., & Shorunmu, T. (2017). Aanaemia in pregnancy and its associated factors among primary care clients in Sagamu, Southwest, Nigeria: A facility-based study. *Journal of Family Medical Primary Care.* 6:323-9. DOI:10.4103/jfmpc_74_16

Singh, M., Brown, G. & Rogerson, S. J. (2013). "Ownership and use of insecticide-treated nets during pregnancy in sub-Saharan Africa: a review," *Malaria Journal,* 12(1): 268. Doi: 10.1186/1475-875-12-268.

Wemakor, A. (2019). Prevalence and determinants of anaemia in pregnant women receiving antenatal care at a tertiary referral hospital in Northern Ghana. *BMC Pregnancy and Childbirth,* 19: 495. https://doi.10.1186/s12884-019-2644-5

World Health Organization (2016). World Health Organization methods and data sources for global burden of disease estimates. Geneva. Department of HealthStatistics and Information.

Yamane T. (1967). Statistics, an introductory analysis (2nd ed). New York: Harper and Row.

Yesufu, B., Olatona, F., Abiola, A., & Ibrahim, M. (2013). Anaemia prevention in pregnancy among antenatal clinic attendees in a general hospital in Lagos. Nigeria. *Quarter Journal Hospital Medical.* 23(4): 280-286. PMID:27276756.

Evaluation of Plant-Based Protein Consumption among Rural Households in Igbo-Eze North Local Government Area, Enugu State, Nigeria

Uloh, E.V., Ede, E.A., Onyeke, A.C., & Bar-Anyam, N.M
Department of Agricultural Education,
Federal College of Education Eha-Amufu, Enugu State

Correspondence: vicbethels99@gmail.com

Abstract

The study evaluated plant-based protein consumption among rural households in Igbo-Eze North Local Government Area, Enugu State, Nigeria. The plant-based protein sources studied include soya bean, cowpea, Bambara nut, pigeon pea and black beans. Data were collected from 120 out of 18,989 households in the study area using a stratified random sampling technique. Data for the study was collected using a questionnaire and oral interview. Descriptive statistics were used to analyze the data generated from the respondents. The result showed that the consumption rate of plant-based protein sources was encouraging as a majority of the respondents consumed Bambara beans (okpa) with a daily consumption of 35%, followed by cowpea (black-eyed beans) with a daily consumption of 26.66%. Many (53.33%) of the respondents spent above ₦31,000 in the consumption of plant-based protein sources monthly indicating that they spend reasonably in their consumption of plant-based protein. Constraints encountered by the respondents in the consumption of plant-based protein include a lack of knowledge about the nutritional benefits of plant protein and the household size of the respondents. It is recommended that agricultural extension agents, health workers and nutritional policymakers should intensify efforts in public enlightenment to rightly inform rural households of the health benefits of plant-based protein foods, as this will help to increase its availability and thereby strengthen their consumption.

Keywords: Plant-Based Protein, Consumption, Rural Households, Health Benefits.

Introduction

Globally, statistics hold that above 900 million people are living in hunger, out of which about 800 million are from developing countries, representing approximately 18 per cent of the world population (Akerele et al., 2015). Buttressing this, Chardigny (2016) asserts that 1/7 of the world population suffers from hunger and one billion people have inadequate protein intake.

Proteins are the major structural components of all cells of the body. It forms the foundation of muscles, heart, hair, skin, brain, blood, teeth and innumerable biomedical activities going on in the body (Ekwe, 2019). Amino acids, which are the building

blocks of proteins, are divided into two different types: essential and non-essential amino acids. Essential amino acids are obtained from the food we eat while the non-essential amino acids can be created out of other chemicals found in the body. Proteins play a diversity of roles in the human body and they are very essential for life. Protein is required for growth, maintenance and repair of all body tissues and they function as enzymes, membrane carriers and hormones (Akerele et al, 2015). The cells of plants contain different proteins which make for a balanced diet, support the growth and development of the body system, production of vaccines and antibodies used for the prevention and treatment of diseases. It also plays a role in the production of seed oils which are very important in boosting agricultural and biofuel production. Proteins contain nitrogen and are sourced from both plants and animals.

Most plant-based protein diets according to Obayelu et al. (2021) including the plants of interest in this research are rich in health-promoting nutrients such as minerals, vitamins, fibre, antioxidants, amino acids and phytochemicals. They are advantageous to the human body in that they improve digestion as they contain many soluble and non-soluble fibres that naturally stimulate digestion and improve metabolism. Plant protein is digested more slowly than fat or carbohydrate because of all the fibres it contains. It strengthens cardiovascular health as it contains very small amounts of saturated fatty acids except coconut and palm oil (Vitalabo, 2003). Aggarwel et al. (2019) propagating the benefits of plant-based protein opined that plant-based protein sources decrease the risk of chronic diseases such as heart disease, high blood pressure (hypertension) high cholesterol, obesity, stroke and type 2 diabetes. In support of this Fitpple (2023) asserts that plant-based protein helps to make our bodies function at their highest level, helps to develop healthy muscles, lose weight, boost immunity, cleanse and energize the body and can aid in quickly getting rid of viruses and infections. Hence, a need for an increased consumption of plant-based protein by man.

According to Wadhaave et al. (2014), the requirement of protein in humans according to level of activity, body weight and age are as follows; men from 19 to 70 years (56g of protein daily), women from 19 to 70 years (46g of protein daily) and children under the age of 8, 19g of protein daily. Depending on the activity level energy needs and body weight of the individual, protein requirements may increase or decrease. Buttressing this, Palacios (2011) asserts that a registered dietician can be consulted to get the exact requirements for a particular individual. On body weight, 0.8g of protein is required per kg of body weight for adults or about 56g of protein for a 70 kg individual. To support growth in children, 2kg of protein is required per kg of body weight (Wadhaave et al. 2014).

Plant protein which is the focus of this work is obtained from various sources such as soya beans (Glycine max), Bambara beans "okpa" (Vigna

subterranean), pigeon pea "fiofio" (Cajanus cajan), cowpea "black eyed beans" (Vignaunguiculata), black beans "akidi" (Vigua unguiculata), mushroom "ero" (Agaricus bisporus), sweet potato (Ipomea batatas), avocado (Persea americana) and green leafy vegetables such as moringa (Moringa oleifera), spinach (Spinach oleracea), water leaf (Talinum fruticosum), pumpkin (Telfaria occidentalis) etc. are rich in vitamins, amino acids, energy and protein. Unlike animal-based protein food which is expensive and not always available, they are low in cholesterol. Bambara nut is sometimes termed as a "complete food" due to its balanced macronutrient composition. It contains 64.4% carbohydrate, 23.6% protein, 6.5% fat and 5.5% fibre and is rich in minerals. The protein content of Bambara groundnut ranges from 9.6 to 40% with an average value of 23%. It is also rich in leucine and lysine which are essential amino acids, but low in fats and fibres (Obayelu et al., 2021). Soya bean also is considered a complete protein as it contains all essential amino acids and possesses 31-36g of protein. Soya bean is said to be the only vegetable food that contains all eight essential amino acids with no cholesterol and is very low in saturated fat (Dudek, 2001; Obayelu et al., 2021). Pigeon pea (Cajanus cajan) known as "fiofio" in the study area is rich in proteins, vitamins and lipids. According to Nwokolo (2022), pigeon pea helps to reduce blood pressure, assist in the formation of cells, tissues, muscles and bones, prevent anaemia, help to enhance the immune system and boost energy levels. Cowpea (Vigna unguiculata) is the most consumed legume in Nigeria; contains between 22-29% protein and is rich in both essential and non-essential amino acids but low in fat content(Isaac,2017).

The production capacity of plant protein in Nigeria is high. This is as Obayelu (2021) mentioned in a FAOSTAT report of 2014 where Nigeria was mentioned as the highest producer of cowpeas in the world. This assertion is supported by Abba (2013) who stated that Nigeria is the largest producer of cowpeas in Africa. Most research works done on the consumption of protein are animal-based and hence, various research works on the consumption of animal protein abounds, despite its associated risk of total mortality, cardiovascular disease, colorectal cancer and type 2 diabetics in both men and women (Richi et al. 2015) This include Ekwe (2019), Akerele et al.(2015), Amao (2013), Abdulahi (2014), Ogunniyi et al. (2012), Lusk and Tousor (2016). Animal protein intake is high in industrialized nations with about 65 to 70% of total protein intake. Rylee et al. (2019) however, worked on plant-based protein consumption but focused on its global acceptance. The only available work that meets the Nigerian peculiarity is Obayelu et al (2021), whose focus was on the demand for plant-based protein by the staff of the University of Ibadan, Nigeria. This is so as Ekwe (2019) reported that protein consumption in Nigeria is mostly animal-based. Buttressing the above argument Chardingny (2016) asserts that it is possible to strike a balance between animal and plant sources on a

1:1 ratio as recommended by the United Nations.

Markie-wicz (2010) argued that the best solution to reduce problems associated with meat consumption would be to replace meat with plant-based protein foods. Grigg (1995) cited by Obayelu (2021) asserts that the protein content of pulses (beans, peas and lentils) is higher than that of meat, fish, eggs or fresh milk and that a plant-based diet can also provide the essential amino acid when combined correctly with cereals and pulses. Striking a balance is a possibility as in most dishes plant proteins are often incorporated into the formulation of foods as Vegetable Protein Products (VPP). These VPP are fractions rich in proteins, obtained by fractionation of raw materials such as seeds of legumes, cereals, grains, oil seeds, tubers (like potatoes) or leaves (foliar proteins from alfalfa). There is therefore the need to investigate the household consumption of plant-based protein in a developing country like Nigeria as there is a dearth of empirical studies on the consumption of plant-based protein sources, especially in Nigeria. The specific objectives of the study are to:

i. examine the socio-economic and demographic characteristics of the respondents;
ii. determine the consumption frequency of plant-based protein sources in the study area;
iii. determine the monthly expenditure on plant protein in the study area and
iv. identify the constraints to the consumption of plant protein in the study area.

Methodology

Study design: This study employed a descriptive survey research design. A descriptive survey research design makes use of interviews, questionnaires and observations to determine people's opinions, attitudes, preferences and perceptions (Anyakoha, 2009). The survey research design was considered appropriate for this study as it elicits information about the consumption of plant protein by the respondents' households.

***Study area*:** This study was carried out in Igbo-Eze North Local Government Area of Enugu State. The Local Government has Umuozzi, Ezzodo, Essodo and Umuitodo as the four major town communities. The population of the Local Government is 259,431 people with an area of 293km^2 (113 sqm). The inhabitants of the area are mostly farmers, businessmen and civil servants.

Population of the study: The population of the study consists of all rural households in Igbo-Eze North Local Government Area. The household population of the Local Government Area is about 18,989 households (Geonames, 2016).

Sample size selection: A multistage sampling technique was used. In stage one, the LGA was divided into clusters based on the number of autonomous communities that make up the LGA, This gave a total of 36 clusters. Stage two involved a random selection of 20 (56%) of the autonomous communities. The purpose of this was to produce a fair representation of the entire Local Government area. In stage three, six

households with an active household head(father/mother) representing 30% of each village, were purposively sampled from each of the 20 selected communities. This procedure gave 120 households which were used for the study. Only the heads of the households (father/mother) participated in the study.

Instrument for data collection: A structured questionnaire titled Plant Protein Consumption Questionnaire (PPCQ) was used for data collection. The questionnaire was divided into sections A, B, C and D. Sections A, sought information on the socio-economic background of the respondents, usually the household head (father or mother). The respondents were selected based on who purchases foodstuffs for the household. Section Belicited information on the frequency of their consumption of plant-based protein among rural households. Percentages were used to determine the frequency of their consumption of plant-based protein in the study area. Items in section C were used to determine the monthly expenditure of the households on plant protein in the study area, while section D sought information on the constraints to the consumption of plant protein in the study area.

Validity and reliability of the instrument: The instrument was validated by three experts, two from the Department of Agricultural Education and one from the Department of Home Economics, Federal College of Education, Eha-Amufu, Enugu State. The instrument was assessed for proper representation, wording and consistency. The internal consistency was determined by the use of Cronbach's Alpha reliability method with a reliability coefficient of 0.83. Hence, the instrument was reliable and suitable for the study.

***Method of data collection*:** One hundred and twenty copies of the instrument were administered to the respondents with the aid of four trained research assistants recruited from the community. They helped in conducting some oral interviews interpreting the questions to the illiterate respondents and filling out the questionnaire items. All the 120 copies of the questionnaires were retrieved and used for data analysis. This indicates a 100% return rate for the instrument. The administration of the questionnaire by the trained research assistants lasted for three weeks. Data was also collected by the use of oral interviews. Their responses were recorded. The essence of the oral interview is also to give the participants opportunities to express themselves rather than restricting them to the questionnaire items.

***Data and Statistical Analysis*:** Descriptive statistics such as frequency and percentages were used to analyse all the research questions. For research question two, items were rated on a 7-point scale rating from Everyday to Never. The overall percentage of frequency of consumption of plant-based protein sources was presented. For research objective 4, items were rated on a 4-point scale of Very High Extent, High Extent, Low Extent and Very Low Extent. The items considered as constraints to the consumption of

plant-based protein were accepted if the total percentage of responses for "High Extent" was greater or equal to 50%.

Results

The socio-economic data of the respondents presented in Table 1 revealed that 81.7% of the respondents who purchase family food-stuffs were women and many of them (48.3%) were between 40 to 59 years old. Most (68.3%) of the respondents were married, 56.7% had a household size of 5-8 persons, 48.3% had primary education and 26.7% had secondary education. Information gathered from oral interviews showed that females purchase household consumption of selected plant-based protein sources than males. Findings showed that more than one-third (42.5%) of the respondents were traders (businessmen/women) while 35% were farmers with many (44.2%) of them having occupational experience of 11- 19 years. Data also showed that 43.3% of the respondents had an annual income between the range of N501,000 – N900,000 per annum.

Table 1: Socio-Economic Characteristics of the Respondents

Socio-Economic Variable	*f*	%
Age		
20-39	26	21.70
40-59	58	48.30
60 and above	36	30.00
Purchase of household foodstuffs by gender		
Male	22	18.30
Female	98	81.70
Household size		
1 – 4	30	25.00
5 – 8	68	56.70
9 and above	22	18.30
Occupation		
Farmer	42	35.00
Artisan	15	12.50
Trading	51	42.50
Civil servant	12	10.00
Education		
Primary	58	48.30
Secondary	32	26.70
Tertiary	8	6.70
No education	22	18.30
Occupational Experience		
Less than 10 years	17	41.10
11 – 19 years	53	44.20
20 – 29 years	32	26.70
30 and above	18	15.00
Estimated Annual Income (₦)		
Less than ₦500,000.00	45	37.50
501,000 – ₦900,000.00	52	48.30
901,000 – ₦1,200,000.00	23	19.20
Marital Status		
Married	82	68.20
Single/divorced	16	13.30
Widowed	22	18.40

Table 2 shows the respondents' rate of consumption of selected plant protein. The result shows that among the selected plant protein sources, Bambara nut "okpa" is consumed more frequently, with daily consumption of 35%, and a 21.66% consumption rate of 5-6 days per week. Cowpea had a daily consumption rate of 26.66% and a 19.16% consumption rate for 5-6 days per week. Black beans "Akidi" was the least consumed with a daily consumption rate of 5.00%, while Soya beans had a 7.50% consumption rate 5-6 days per week. The table also gave an overall consumption of selected plant protein to be 85.83% daily, 79.16% 5- 6

days a week, and 37.50% consumed plant protein only during festivities.

Table2: Respondents Frequency of consumption of selected plant protein

Selected plant protein sources	Every day(7)	5-6 days/week(6)	3-4 days/week(5)	1-2 days/week(4)	Once in 2 days(3)	During festivities(2)	Never(1)
Cowpea (Black-eyed beans)	32(26.66)	23(19.10)	18(15.00)	30(25)	10(8.3)	6(5)	1(0.80)
Bambara nut (okpa)	42(35.00)	26(21.60)	30(25.00)	14(11.66)	2(1.6)	6(5)	0(0.00)
Pigeon pea (fiofio)	15(12.50)	19(15.80)	25(20.83)	24(20)	29(24.16)	8(6.66)	0(0.00)
Soya beans	8(6.66)	9(7.50)	15(12.50)	14(11.66)	32(26.66)	22(18.33)	20(16.66)
Black beans (Akidi)	6(5.00)	18(15.00)	20(16.66)	28(23.33)	15(12.5)	3(2.50)	28(23.33)
Overall consumption	103(85.83)	95(79.16)	108(90)	110(91.66)	88(73.33)	45(37.50)	49(40.83)

The distribution of the respondents according to their monthly expenditures on selected plant protein sources (Cowpea, Bambara nut, Pigeon pea, Soya beans, and Black beans) in the study area is presented in Table 3. The result shows that 35.67% of the households studied spend between ₦16,000 and ₦30, 000 monthly on the consumption of selected plant protein sources. The table further shows that a greater proportion (53.33%) of the respondents spend ₦31,000 and above in the consumption of plant proteins monthly, while a few spend less than ₦15,000 monthly on plant protein.

Table 3: Monthly Expenditure of the Respondents on Selected Plant Protein Sources

Monthly Expenditure Ranges (₦)	f	%
Less than 15, 000	12	10.00
16,000 – 30,000	44	35.67
31,000 and above	64	53.33
Total	**120**	**100**

Table 4 shows the constraints to the consumption of plant-based protein in the study area. The result showed that lack of knowledge about the health benefits of protein had a total rating percentage of 69.16%, the financial status of the household head (72.49%), lack of knowledge about the health benefits of protein (75.83%), household size and composition (72.49%), and limited availability of various plant protein (82.0%); and were therefore accepted as the constraints reported by the respondents. The educational status (42.49%) and health condition of the household members (47.50%) were not

considered constraints to the consumption of plant-based protein sources in the study area since their total High Extent ratings were less than 50%.

Table 4: Constraints to the Consumption of Plant-Based Protein Sources

Constraints to the consumption	Very High Extent	High Extent	Low Extent	Very Low Extent	Total High Extent rating	Remarks
	F (%)	F (%)	F (%)	F (%)	F (%)	
Price of the commodity	40(33.33)	43(35.83)	22(18.33)	15(12.5)	83(69.16)	Accepted
Financial status of the household head	37(30.83)	50(41.66)	15(12.50)	18(15.0)	87(72.49)	Accepted
Lack of knowledge about the nutritional benefits of plant proteins	61(50.83)	30(25.0)	17(12.50)	14(11.66)	91(75.83)	Accepted
Educational status of the household head	28(23.33)	23(19.16)	54(45.0)	15(12.50)	51(42.49)	Not Accepted
Household size and composition	56(46.66)	31(25.83)	16(13.33)	17(14.16)	87(72.49)	Accepted
Health condition of household members	30(25.00)	27(22.50)	49(40.83)	14(11.66)	57(47.50)	Not Accepted
Limited availability of various plant protein	54(45.00)	45(37.50)	13(10.83)	8(6.66)	99(82.50)	Accepted

Discussion

The research study analysed the consumption frequency of selected plant protein sources in Igbo-Eze North Local Government Area of Enugu State, Nigeria. The findings of this study based on oral interviews and information gathered from the questionnaires showed that females patronize the purchase of household consumption of selected plant protein than males. This is an indication that women are more committed to kitchen activities in the family than men. This assertion is in agreement with the findings of Babayemi et al (2017) and Uloh et al (2022), whom both asserted that culturally, men financially empower their wives, while the women select the daily menu for the family. The finding further revealed that the respondents were mostly middle-aged adults. Hence, they are mentally alert to know the dietary

needs of their households. This statement agrees with Ekwe (2019) who asserted that respondents' being at their productive age helps to provide family food security. From the findings, most of the respondents were married with a mean household size of six persons indicating that the respondents are displaying their responsibility to family sustainability and livelihood. Educationally, the finding revealed a good level of literacy among the respondents as a good number (48.3% and 26.7%) of them had their primary and secondary education respectively. This could help to enhance their dietary consumption of plant protein having known its health benefits. The respondents' expenditure on selected plant protein was encouraging as 28.3% of the respondents spend ₦25,000 and above monthly on the consumption of plant protein sources. This disagrees with the findings of Ekwe (2019) where due to low levels of income, the consumption of plant protein in Agwu, Enugu State, Nigeria was equally low.

The finding shows that plant protein sources generally were frequently consumed among the rural households in the study area. The plant protein sources mostly consumed by the households in this study were Bambara nut (okpa), cowpea and pigeon pea. This frequent consumption could be because of the availability and preference of the foods. It could also be due to the societal acceptance of the end products of their preparations, method and skill for the preparation and also the means of storage of the prepared food products. This agrees with Obayelu et al (2021) where cowpeas had the highest demand and consumption among the selected plant-based proteins among the staff of the University of Ibadan, Nigeria. From the findings, the respondents occasionally consumed soya beans and black beans (Akidi). This is possibly due to the cost and unavailability of akidi all year round, the people's level of exposure and education about the health benefits of soya beans. It could also be because black beans and soya beans are not readily used in a variety of dishes as the other plant protein sources.

The monthly expenditure on the consumption of plant-based protein sources in the study area was high and encouraging. This implies that average households in the study area spend reasonably on the consumption of plant-based protein. This could be a result of their likeness to the food forms of Bambara nut (okpa), cowpea (moi moi and akara) and pigeon pea (fiofio) that are mostly used as breakfast, lunch and supper by households and individuals in the study area. These findings correlate with that of Amao (2013) where a great number of households in Ila Local Government Area of Osun State, Nigeria spend ₦20,000 and above monthly in their consumption of both plant and animal protein.

The constraints to the consumption of plant protein sources identified in the study area include lack of knowledge about the health benefits of plant protein, the financial status of the household head, the price of the commodity, lack of knowledge about the nutritional benefits of protein,

household size and composition, and limited availability of various plant protein. For instance, the knowledge of the nutritional benefits of soya beans will help enhance its consumption in the study area. However, the educational status of the household head and the health condition of the household members were not considered as constraints to the consumption of plant-based proteins in the study area. This finding disagrees with that of Obayelu et al (2021) where the educational status of the respondents positively affected the demand for soybean consumption amongst the staff of the University of Ibadan, Nigeria. The finding of the current study indicates that adequate consumption of plant proteins might not constrained by how educated the household heads are, but rather how knowledgeable they are about the nutritional benefits of plant proteins. In addition, the financial status of the family, the price of the foods and the household size might constrain the affordability of plant-based proteins by households.

Conclusion and Recommendation

This study has provided information on the consumption of plant-based protein among households in Igbo-Eze North Local Government Area of Enugu State. Findings revealed that the rate of consumption of some plant-based proteins such as Bambara nut (okpa) and Cowpea (black-eyed beans) in the study area was encouraging. There was more female patronage of plant-based protein foods than males. This is probably because women are more involved in kitchen and cookery activities than men. Constraints to the consumption of plant-based consumption were mostly the lack of knowledge about the nutritional benefit of plant-based protein foods to the body, and the limited availability and affordability of the foods. From the ongoing, considering the nutritional benefits of protein in the body, there is still a need for increased consumption of plant-based proteinous food in the study area, especially soya beans and black beans which are least consumed in the study area.

Recommendations

Having evaluated the consumption of plant-based protein in the study area, it is recommended that:

i. There is a need for the government, farmers and marketers to emphasize increased production and marketing of plant-based proteins, especially Bambara nut (okpa) and cowpea (blacked-eyed beans) as it is the most demanded among the selected plant-based protein sources in the study area.
ii. Agricultural extension, health workers and nutritional policymakers should intensify efforts for public enlightenment to rightfully inform rural households of the health benefits of plant-based protein sources especially for black beans(akidi) and soybeans which are the least consumed selected plant-based protein foods.
iii. Considering the high cost of plant-based protein sources as complained by the respondents, government intervention towards pricing is

recommended at all levels to bring down prices of protein food sources to make them affordable to all and sundry.

References

Abba, M.W. (2013). Economic analysis of cowpea production in Nigeria. *Russian Journal of Agricultural and Socio-Economic Sciences*. 1(13), 60-65. https://doi:10.18551/rjoas.2013-01.08.

Abdullahi, A., & Aubert, D. (2004). A cross-section analysis of household demand for food and nutrients in Tanzania. Agricultural Economics, 31: 67-79.

Aggarwel, A., & Drenowski, A. (2019). Plant and animal protein diet relation to sociodemographic driver, quality and cost: findings from the Seattle obesity study. *The American Journal of Clinical Nutrition*, 110(2), 451-460. https://doi:10.1093/aicn/n9zo64.

Akerele, E.O., Ologbon, O.A.C., Otunaiya, A.O.,& Ambali, P.O. (2015). Analysis of beef consumption pattern among rural households in Yewa South Local Government Area of Ogun State, Nigeria. *Journal of Sustainable Development in Africa*. Clarion University of Pennsylvania Clarion, Pennsylvania. 17(8). www.cabdirect.org.

Amao, J.O. (2013). Determinants of protein consumption among households in Ila Local Government Area of Ogun State, Nigeria. *Middle-East Journal of Scientific Research* 15(10), 1401-1410. https://doi:10.5829/idose.mejsr./2013. 15.10.11049.

Anyakoha, E.U. (2009). Developing research skills. Concepts and conceptual framework. Great AP Express Publishers Ltd.

Babayemi, O.J., Ajayi, M.O., Akinsola, S.O., & Dauda, M.O. (2017). Assessment of meat demand: A case study of University of Ibadan for beef enterprise. *Nigerian Journal of Animal Production*.44(3), 186-193. https://doi:10.51791/injap.v44i3.621.

Chardigny, J-M.,& S. Walrand. (2016). Plant protein for food: opportunities and bottlenecks. OCL. *Oilseeds and Fats, Crops and Lipids*. 23(24). www.ocl-journal.org. https://doi:10.1051/Ocl/2016019.

Dudek, S.G. (2001). Nutrition essentials for nursing practice (4th ed.). Philadelphia: Lippinicott.

Eboh, E. C.(2009). Social and economic research. principles and methods. African Institute for Applied Economics.

Ekwe, K.C. (2019). Consumption frequency of selected animal protein sources among rural households in Enugu State, Nigeria. *Journal of Community and Communication Research*. 4(2), 53-61. www. Jccr.sccdr.org.

FITPPL, LLc. (2023). Surprising health benefits of plant-based proteins. Newsletter. https://fitpple.com/7

Geonames. (2016). Geonames geographical database. Population. mongabay.com. www.geonames.org. Retrieved 9/9/2023

Isaac, N. (2014).GMO Cowpea offers hope for boosting nutrition, economy in Nigeria. Alliance for Science. https:// www.allianceforscience.org.

Lust, J.L.,& Tousor, G.T. (2016). How meat demand elasticities vary with price, income and product category. *Applied Economic Perspectives and Policy, 38*(4) 673-711.

Markiewicz, K. (2010). The economics of meeting future protein demand. https://edepot.wur.nl/145744.

National Population Commission. (2006). Nigerian population census. Federal Republic of Nigeria official gazette, 94.

Nwokolo, Collins. (2022). 10 Superb health benefit of pigeon peas (fiofio). https://healthguide.ng

Obayelu, O.A; Godwin, D.O; R.B, Ibe and E.A, Akinwale. (2021). Demand for selected plant-based protein among the staff of a tertiary institution in Nigeria. Future of food: *Journal on Food, Agriculture and Society.* 9(3). https://doi:10.17170/Kobra-202102163266.

Ogunniyi, L.T., Ajiboye, A.,& Sanusi, W.A. (2012). Analysis of urban household demand for poultry products in Ogbomosho North and South Local Government Area, Oyo State, Nigeria. *Tropical and Sub-tropical Agroecosystems, 15*(1): 125-130. https://www.researchgate.net/publication/289303060_Analysis_of_urban_household_demand_for_poultry_products_in_Ogbomoso_north_and_south_local_government_area_Oyo_state_Nigeria

Richi, E. B., Baumer, B., Conrad,B., Darioli,R.,Schmid,A.,&Ulrich,K.(2016). Health risks associated with meat consumption: A review of Epidemiological studies. *International Journal for Vitamin and Nutrition Research, 85*(1-2). https://doi.org/10.1024/0300-9831/a000224.

Rylee, T.A., Satya, S.J.,& Joanne, L.S. (2019). Role of plant protein in nutrition, wellness and health. *Journal of Nutrition and Review, 77*(11). 735-747. https://doi.org/10.1093/nutrit/nuz028

Uloh, E.V., Okocha, O.I; Bar-Anyam., N.M., Nnaji, J.R & Acha, I.P. (2022). Beef consumption pattern among rural households in Igbo-Eze North Local Government Area of Enugu State, Nigeria. *Journal of Family and Society Research 1*(2). https://jfsr.afass.org.ng/index.php/JFSR/article/view/26

Vitalabo. (2023). 6 Advantages of plant-based proteins. https://www.vitalabo.com/info/magazine/6-

Wadhave, A.A., Jadhav, A., & Arsul, V. (2014). Plant proteins applications: A Review. *World Journal of Pharmacy and Pharmaceutical Sciences*, 3(3). 702-708 https://www.researchgate.net/publication/261727360_PLANT_PROTEINS_APPLICATIONS_A_REVIEW

J. of Family and Society Research 2 (2), December 2023, pp. 132 - 144

Determination of Nutrient and Phytochemical Profile of Basil (*Ocimum gratissimum)* Leaves and Seeds

Okoye, O.I., Ezegbe, A.G. & Ugwu, C.F.
Department of Home Science and Management,
University of Nigeria, Nsukka

Correspondence: obiageli.okoye@unn.edu.ng

Abstract

The sustainable use of plant parts such as basil (*Ocimum gratissimum)* leaves and seeds is beneficial as they are believed to possess various nutritional and therapeutic values. The study investigated the nutrient and phytochemical profile of basil leaves and seeds. Specifically, the study analysed the proximate composition (moisture, crude protein, fat, ash, crude fibre and carbohydrate); vitamin content (pro-vitamin A, vitamin C and vitamin E) and phytochemical content (flavonoid and phenol) of basil leaves and seeds. Samples were processed into flour using different methods. The proximate, vitamin and phytochemical compositions of the samples were analysed in triplicates using standard methods. All data were presented as means ± standard deviations. Proximate analysis results showed that the protein content of basil seeds ranged from 14.90 - 14.93%. The Ash content of the samples varies from 4.28 - 10.45%. The concentration of crude fibre in basil leaves and seeds ranged between 14.20 - 15.77%. The vitamin analysis result showed that the pro-vitamin A content of the samples ranged from 11.28- 170.70µg/100g. Analysis of phytochemical content showed that the value of flavonoids in the samples varied from 16.67 -22.78mg/100g. The phenol content of the samples ranged between 21.71 and 23.74mg/100g. Results showed that basil leaves and seeds contain significant quantities of nutrients and phytochemicals. The findings of the study indicated that basil leaves and seeds could be used as raw materials in food and pharmaceutical industries to manufacture spices, beverages and nutraceuticals.

Keywords: Basil, Leaves, Seeds, Proximate, Vitamins, Phytochemicals

Introduction

Medicinal plants possess different parts with varying concentrations of nutrients and phytochemicals. These nutritional and medicinal properties can come from many different parts of a plant including stems, leaves, roots, seeds, fruits, and flowers (Rabizadeh et al., 2022). Nutrients are very important to life since they provide energy, function as building blocks and are necessary to regulate chemical processes. Macronutrients and micronutrients are essential dietary elements required by humans in varying quantities throughout life to perform a range of physiological functions (Gibney et al., 2009). Phytochemicals are nonnutritive, bioactive chemical compounds found in plant foods, which are considered to be beneficial to human health. They include alkaloids, flavonoids, phenol glycosides and others (Rabizadeh et al., 2022). These bioactive compounds of plants exhibit multiple therapeutic

activities including anti-microbial, anti-oxidative, anti-inflammatory, and anti-cancer activities (Ranjha et al., 2020).

Globally, the incidence of non-communicable diseases and their associated pathological complication is growing rapidly (World Health Organisation, WHO, 2022). Non-communicable diseases are a diverse group of chronic diseases that are not transmissible from one person to another but are typically caused by unhealthy behaviours (WHO, 2017). Examples of these non-communicable diseases are cardiovascular diseases, diabetes, cancers, hypertension, chronic respiratory diseases and others. WHO (2022) reported that these chronic diseases kill 41 million people each year, equivalent to 74% of all deaths globally. Non-communicable diseases have been projected to be a leading cause of morbidity and mortality in Nigeria by 2030 (WHO, 2017).

An unhealthy diet is one of the major causes of these chronic diseases which contributes to oxidative stress and excessive free radical production (Halliwell & Gutteridge, 2007; Amit & Priyadarsini, 2011). It has been identified that a lack of essential nutrients can affect proper growth and cognitive development (Allen et al., 2006). An unhealthy diet, typically high in sugar, saturated fat, and salt and low in vegetables and fruits, can contribute to the development of non-communicable diseases (NCDs) (Francesco et al., 2019). This can often lead to diet-related non-communicable diseases such as diabetes. The consequences can be devastating, these include irreversible impairment to physical and cognitive development, severe visual impairment or blindness, xeropthalmia, convulsion, neurological disorders, pellagra, beriberi, rickets, impaired cognitive function, anaemia, morbidity, mortality and substantial losses in individual and national productivity (Allen et al., 2006; WHO, 2014; Francesco et al., 2019).

Nutrition therapy is important in preventing, and managing existing diseases and slowing the rate of development of disease complications of these chronic diseases (American Diabetic Association, (ADA), 2013). A healthy diet can reduce the risk of cardiovascular diseases, cancer, diabetes and other conditions, Utilization of these medicinal plants is important to prevent the widespread and minimize the occurrence of diet-related non-communicable diseases in adults. Research has demonstrated that nutrition plays a crucial role in the prevention of chronic disease (Akinmoladun et al., 2007). Plant components such as leaves and seeds are considered to have therapeutic potential for the management of chronic diseases such as diabetes mellitus, hyperlipidemia, or cancer (Akinmoladun et al., 2007; Johnson & Melissa. 2015). Healthy foods can promote health, improve general well-being, and reduce the risk of developing certain illnesses (WHO, (2002).

Ocimum gratissimum is a widely known and commonly consumed medicinal plant. The plant belongs to the Genus of *Ocimum Lamiaceae* (basil) and is a species of *Ocimum gratissimum*. is a scented shrub with lime-green

leaves (United States Department of Agriculture, 2008). It is the most abundant of the genus *Ocimum* and its common names are clove Basil, Scent leaf, Fever plant or Tea bush. *Ocimum gratissimum* plant is a perennial plant that is widely distributed in the tropics of Africa and Asia (Cohen, 2014). It is woody at the base and has an average height of 1-3 meters. *Ocimum basilicum* is an annual plant found widely in the tropical, subtropical and temperate regions of the world (Cohen, 2014).

The leaves are edible portions of plants that are consumed as food by humans. It is popularly known as a scent leaf. The leaves are broad and narrowly ovate, usually 5-13cm long and 3-9cm wide. Basil seeds are dark brown in colour and with round shapes. The leaves can be used fresh or dried to add a distinctive flavour and aroma to foods. They are highly appreciated for their pleasant aroma and are used as seasoning, and medicine and are eaten as a vegetable (Osuagwu et al., 2010). Basil leaves and seeds are good sources of essential nutrients such as carbohydrates, protein, fat, vitamins and minerals, and excellent sources of phytochemical and dietary fibre (Jimoh & Oladiji, 2005; Zahran et al., 2020). They possess nutritional and therapeutic potentials that can enhance immunity. They have been reported to have anti-carcinogenic effects, anti-inflammatory, hypoglycemic and antioxidant potential (Hamid et al., 2010; Egata, 2021).

Studies have shown that basil seeds can be used in the manufacture of beverages, liqueurs, vinegar, drinks, and teas, and are used in the food, pharmaceutical, and cosmetic industries (Hosseini-Parvar et al., 2010; Hajmohammadi et al.,2016; Naji-Tabasi & Razavi, 2017). The seeds are commonly added to bakery products as a source of dietary fibre for technological purposes (Hajmohammadi et al., 2016; Rezapour et al ., 2016). The mucilage extracted from basil seeds has been widely studied and has good functional properties such as emulsifying, foaming, thickening, stabilizing, viscosity, and gelling properties (Nazir et al., 2017; Bravo et al., 2021). Seeds of basil have been used as traditional medicine for the treatment of dyspepsia, ulcers, diarrhoea and other illnesses. Studies have shown that leaves and seed extracts of *ocimum gratissimum* exhibit many nutritional and medicinal values (Shuaib et al., 2015; Keith, 2018; Bravo et al.,2021). Basil seeds contain some powerful antioxidant vitamins and minerals which have diuretic, antipyretic, antispasmodic, analgesic hepatoprotective and anti-inflammatory effects (Uhegbu, et al., 2012; Zahran et al., 2020).

Basil leaves and seeds are considered to be underutilized since they can offer alternative and cheaper sources of macro and micronutrients as well as antioxidant potential. They are easily cultivated and grown in Nigeria. Good management of these natural resources is very crucial in the family to achieve a healthier lifestyle since synthetic drugs have several side effects besides many benefits they offer. Analysis of these edible medicinal

plant parts can play a crucial role in assessing their nutritional significance (Pandey et al., 2006). This study therefore aimed to provide information on the nutrient and phytochemical compositions of the leaves and seeds of basil. This will help to justify and validate its usage and suitability as a medicinal plant with various antioxidant properties.

Objectives of the Study

The general objective of the study was to investigate the nutrient and phytochemical profile of Basil (*Ocimum gratissimum)* leaves and seeds. Specifically, the study determined:

1. the proximate composition (moisture, protein, fat, ash, crude fibre and carbohydrate) of *Ocimum gratissimum* leaves and seeds;
2. the vitamin composition (pro-vitamins A, vitamin C and vitamin E) of *Ocimum gratissimum* leaves and seeds
3. the phytochemical content (flavonoid and phenol) of O*cimum gratissimum* leaves and seeds.

Materials and Methods

***Design of the Study*:** The study adopted an experimental research design. The proximate, vitamins and phytochemical content analysis were conducted in the food and analytical laboratory of the Nutrition and Dietetics/Home Science and Management Department, University of Nigeria, Nsukka.

***Procurement of Materials*:** Two hundred (400g) of Basil (*Ocimum gratissimum*) leaves and seeds were procured from Home Garden, Edem Ani Nsukka Enugu State, Nigeria. O*cimum gratissimum* leaves and seeds were identified at the Department of Plant Science and Biotechnology, University of Nigeria, Nsukka.

***Preparation of samples for chemical analysis*:** The leaves (400g) were separated from the stems, sorted to remove defects, washed twice with distilled water to remove dirt and sand, drained in a plastic sieve, cut into smaller sizes, dried in an oven at a temperature of 40 °C for 4 hours and ground into flour using a blender (Soyona Japan).

The seeds (400g) were sorted by separating them from the stalk, stems and leaves, washed, drained and were oven- dried at 40°C for 4 hours, ground into flour using a blender (Soyona Japan). The ground samples (both the leaves and the seeds) obtained were packaged in a plastic container air-tight container, labelled and stored at room temperature for laboratory analysis.

***Chemical Analysis*:** This involved proximate, vitamin and phytochemical analysis of the two samples.

***Proximate analysis*:** The proximate analysis of the O*cimum gratissimum* leaves and seeds for moisture, ash, fat, crude protein and carbohydrate were determined as described by the Association of Official Analytical Chemists, AOAC (2010).

Moisture content: Two grams of the samples were placed in each of the aluminum dishes. These in turn were transferred to a thermostatiscally controlled oven at a temperature of 105^{O}C and normal atmospheric pressure. Drying was continued until a constant mass was obtained.

Amount of moisture= initial mass (mass of empty container + wet sample) -- final mass (mass of empty cup + dry sample)

Fat content: The fat content of the samples was determined using the Soxhlet extraction method. The defatted samples were removed and the solvent recovered. The flask and the content were reweighed. The flask was cooled in a desiccator and weighed.

***Ash content*:** Two grams of the samples were weighed into a crucible which was previously ignited and cooled before weighing. The crucible and its contents were heated on a muffle furnace at a temperature of $55^{O}C$ then transferred into desiccators and cooled for 15-30 minutes. It was then weighed and the percentage of ash was calculated.

***Crude fibre content*:** Two grams of the sample were weighed into a crucible and placed in a hot 200ml of 1.25% tethraoxosulphate (H_2SO_4) and boiled for 30 minutes.

***Crude protein content*:** Twenty grams (20g) of the samples were weighed and carefully transferred to a Kjeldahl flask. Titration was against standard 0.1N(normal solution) of HCl. The difference in weight between oven-dry weight and weight after incineration was taken as the fibre content of the sample.

***Carbohydrate content*:** This was determined by the difference method; 100 – Total % content of other components. CHO=100- (%crude protein + %Ash + %crude fibre + %moisture +% fat)

Vitamin Determination

***Pro-vitamin A (β-Carotene*):** The procedure of Jakutowicz et al. (1997) was used. One gram of the sample was weighed. Then the proteins were first precipitated with 3ml of absolute ethanol b/4 the extraction of vita with 5ml of heptane. The test tube containing this was shaken vigorously for 5 minutes. On standing, 3ml from the heptane layer was taken up in a cuvette and read at 450nm against a blank of heptane. The standard was prepared, read at 450nm and pro-vit. A was calculated.

Determination of Vitamin C & Vitamin E:The AOAC (2010) method was used. Five grammes (5g)of the sample were weighed into a flat-bottom flask and 60 ml TCA/Acetic acid solution was added. The mixture was left for about an hour before it was filtered. The filtrate was made up to 200ml. Ten millilitres 10ml was taken for titration with 0.05% 2, 6-dichlorophenol indophenols. The vitamin C content was calculated. Vitamin E absorbance of the solution was then taken at 520nm against a blank

Phytochemical determination

Total flavonoid content: This was determined according to the method of Harborne (I973). Five grams of each of the samples was boiled in 50ml of 2M HCl solution for 30 minutes under reflux. The dried crucible was reweighed and the difference in the weight was then the quantity of flavonoid content in the sample.

Total phenol content: Total phenol was determined according to the method of Edeoga, Okwu and Mbabie (2005). Five grams of the sample was pipette into a 50ml flask, and then 10 ml of distilled

water was added. 3 ml of ammonium hydroxide solution and 5 ml of concentrated amyl alcohol were added. The extracts were made up to mark and left to react for 30 minutes for colour development. Total phenol content was measured at 505 nm.

Statistical Analysis

Data obtained in this study were analyzed using IBM SPSS Statistics version 22. Descriptive statistics such as means and standard deviation were used to present results.

Results

Proximate composition of leaves and seeds of *Ocimum gratissimum*

Table 1 presents the proximate composition of the leaves and seeds of *Ocimum gratissimum*. The protein content of the samples ranged between 14.90% to 14.93% where the fresh seeds were higher (14.93%) and the leaves (14.90%). The moisture content of the leaves was higher (10.66%) than the seeds (4.86%). The fat content of the seeds was higher (28.49%) than the leaves (5.63%). The Ash content of the samples ranged between 4.28 - 10.45% where the leaves recorded a higher value (10.45%) than the seeds (4.28%). The crude fibre content of the samples ranged between 14. 20 – 15.77%. The concentration of the leaves was higher (15.77%) than the seeds (14.20%). The carbohydrate value of the leaves was higher (42.57%) than the seeds (33.35%).

Table 1: Proximate composition of leaves and seeds of *Ocimum gratissimum*

Sample	Protein (%)	Moisture (%)	Fat (%)	Ash (%)	Crude fibre (%)	Carbohydrate (%)
Leaves	14.90±0.78	10.66.78±0.38	5.63±0.27	10.45±0.03	15.77±0.04	42.57±0.79
Seeds	14.93±0.70	4.86±1.21	28.49±0.79	4.28±0.76	14.20±0.28	33.35±0.52

n=3, values are represented as mean ± standard deviation

Vitamin composition of the leaves and seeds of *Ocimum gratissimum*

Table 2 presents the vitamin composition of the leaves and seeds of *Ocimum gratissimum.* The pro-vitamin A content of the samples ranged between 11.28 to170.7 µg/100g. The leaves contained a higher concentration of pro-vitamin with a value of 170.7 µg/100g than the seeds (11.28mg/100g). Vitamin C content of the samples ranged between 11.15 to 12.01mg/100g where the seeds recorded 11.15mg/100g and the leaves (12.01mg/100g). Vitamin E content of the samples varied from 0.17 to 0.31g/100g where the seeds had a higher concentration (0.17mg/100g) than the leaves (0.31g/100g).

Table 2: **Vitamin composition of the leaves and seeds of *Ocimum gratissimum***

Samples	Pro-vitamin A (µg/100g)	Vitamin C (mg/100g)	Vitamin E (mg/100g)

Leaves	170.7±2.67	12.01±0.04	0.17±0.05
Seeds	11.28±0.09	11.15±1.17	0.31±0.00

n=3, values are represented as mean ± standard deviation

Mineral composition of leaves and seeds of *Ocimum gratissimum* (mg/100g)

Table 3 presents the phytochemical composition of the leaves and seeds of *Ocimum gratissimum*. It shows that the flavonoid content of the samples ranged between 16.67 to 22.79mg/100g where the value of the seeds was higher (22.79mg/100g) than the leaves (16.67 mg/100g). The phenol concentration of the seeds was higher (23. 74mg/100g) than the leaves (21. 7mg/100g).

Table 3:Mineral composition of leaves and seeds of *Ocimum gratissimum*(mg/100g)

Samples	Flavonoid	Phenol
leaves	16.67±0.23	21.71±0.01
Seed	22.79±0.13	23.74±0.01

n=3, values are represented as mean ± standard deviation

Discussion

The crude protein content of the leaves and seeds of the basil plant in the study ranged between 14.90 to 14.93%. This is not in line with works by Bravo et al. (2021) where the crude protein of basil leaves and seeds ranged between 11.4–22.5%. The differences in crude protein content could be attributed to genetic variation and climatic or regional soil differences. Proteins in these samples could act as enzymes, hormones and antibodies that are involved in numerous metabolic processes in the body. Dietary proteins are responsible for bodybuilding, formation of bones, teeth, hair and the outer layer of skin, maintaining the structure of blood vessels and other tissue, and can help in cell division as well as growth (Mgbeje et al., 2019).

The moisture content of the samples was within the range (4.86 – 10.66%). The findings are not in agreement with the moisture content reported by Olumide et al. (2019) with a value range of 13.50 -14.50%. The moisture content of food is an index of shelf life stability and quality (Shahzadi et al., 2005). Moisture or water is a universal solvent which dissolves other substances and carries nutrients and other materials throughout the body, thus, making it possible for every organ to perform its function effectively (Reichardt & Timm, 2020).

Ash content of the samples varied between 4.28% and 10.45%. This is higher when compared with the findings by Ishola et al. (2017) who reported a lower value range (4.54 - 4.38%). Ash content in food samples is a reflection of the mineral contents. Minerals are inorganic- substances which are essential in human nutrition for metabolism and overall chemical processes in the body. Studies have shown that dietary ash plays an important role in regulating blood sugar as well as maintaining acid-alkaline balance (Chinedu et al ., 2018).

The crude fibre contents of the leaf and seed of *Ocimum gratissimum* ranged from 14.20 – 15.77%. The findings do not agree with the findings

by Bravo et al. (2021) who reported crude fibre content with a value range of 7.11 to 26.2 %. Crude fibre could serve as a good dietary fibre source. Several studies have reported that fibre facilitates the absorption of trace elements in the gut, and can lower the risk of coronary disease, hypertension, constipation, diabetes, and colon and breast cancer (Adepoju et al., 2012; Graf et al., 2015). Fibre diets are an important component of diabetes management, resulting in improvements in measures of glycaemia control, blood lipids,

The fat content of the samples ranged between 5.63% - 28.49%. The result varies with the findings by Ishola et al. (2017) who reported lower fat content with value range (6.34 - 6.5%). This difference in composition could have been a result of differences in the nutrients of the soil, the age of the plant at harvest, environmental factors, method of cultivation, seasonal variation and time of harvesting. Dietary fats are important because of their high energy value and can help in absorption of the fat-soluble vitamins (Vitamin A, E, D and K). Essential fatty acids can help in cognitive development, and overall cell function and protect the body's organs. blood pressure and play a useful role in the synthesis and repair of vital cell parts (Duyff, 2017).

The carbohydrate content of the leaves and seeds of *Ocimum gratissimum* ranged between 33.35 - 42.57%. Carbohydrate in human diets is a key source of energy (Keim et al., 2014). Ahaotu and Lawal (2019) reported that a low carbohydrate diet could reduce the risk of cardiovascular diseases and control diabetes among obese patients.

The findings of the study in Table 2 showed the antioxidant vitamin composition of the samples. The pro-vitamin A content of the samples ranged between 11. 28µg/100g to 170. 28 µg/100g. Pro vitamin A in the diet can act as antioxidants which are potential scavengers of free radicals in the body and can protect the body against ill health and ravages of aging (Granato et al., 2018). They are essential for gene expression growth, cell differentiation and integrity of epithelial tissues, reproduction immune system function, contribute to healthy skin colour, support normal vision, protect human lymphocytes from damage by singlet oxygen and lower the risk for several degenerative disorders, including various types of cancer, cardiovascular or ophthalmological diseases (Gibney et al., 2009).

Antioxidant Vitamin C in the samples ranged from 20.62mg/100g to 27.73mg/100g. Vitamin C are a powerful antioxidant which has positive effects in the treatment of numerous chronic diseases such as cancer, diabetes, and cardiovascular diseases (Mgbeje et al., 2019). Studies have shown that vitamin C in the basil plant can scavenge free radicals from the body cells and prevent or reduce the damage caused by oxidation, promoting the growth and repair of tissues, and essential for the synthesis of collagen and carnitine (Keith, 2018; Egata, 2021).

Vitamin E in the diet can act as an antioxidant which can inhibit, and prevent oxidation in fats or lipids and can help protect body tissue from damage caused by free radicals which can harm cells, tissues, and organs (Traber & Atkinson, 2007). Studies have reported that this fat-soluble vitamin in the diet can break the free radical chain reaction, help prevent cellular damage in the liver, protect enzymes and hormones, as well as the polyunsaturated fatty acids of biological membranes and low-density lipoprotein against oxidation by oxygen radicals (Awah & Verla, 2010; Traber & Atkinson, 2007; 2016; Zahran et al., 2020).

The findings of the study in table 3 showed that the flavonoid content of the samples ranged between 16.67 to 22.79mg/100g. This is not in line with works by Tarayrah et al. (2022) with a value range (of 9.0 to 34.2mg/100g). The presence of flavonoids in the samples supports their use in the treatment and management of diabetes since flavonoids act as antioxidants in biological systems (Nimse & Pal, 2015). Flavonoids are an important part of the human diet that can influence the quality and stability of foods by acting as flavourings, and colourants with antioxidants, anti- inflammatory and anti- diuretic effects (Takemoto & Takemoto, 2018). Many studies have suggested that flavonoids exhibit biological activities including antiallergenic, antiviral, anti-inflammatory and vasodilating actions((Takemoto & Takemoto, 2018; Tarayrah et al., 2022).

Phenol content of the samples was lower (21.71 to 23.74mg/100g) when compared with works byTarayrah et al. (2022) with value range (51.0 to 58.2mg/100g) where the leaves recorded 51.0mg/100mg and seeds (58.20 mg/100g). Numerous studies have shown that basil seeds and leaves are excellent sources of antioxidants with their high content of phenolic compounds which are therapeutically useful in the management of diseases(Uhegbu et al., 2012; Rajendran et al., 2014; Omodamiro & Jimoh, 2015; Njoku et al., 2011). They are associated with skin protection, brain function, blood sugar and blood pressure regulation, in addition to antioxidant and anti-inflammatory activity (Hamid et al., 2010; Zahran et al., 2020; Bravo et al., 2021).

Conclusion

Nutrient and phytochemical analysis of plants is very important in assessing their nutritional significance. It shows that the leaves and seeds of *Ocimum gratissimum* could be good sources of nutrients, antioxidants vitamins and phytochemicals that are very important in the prevention and maintenance of nutrition-related diseases. In conclusion, it indicates that basil seeds and leaves are natural sources of nutrients, antioxidants and phytochemicals that can prevent and manage many nutrition-related diseases.

Recommendations

The following recommendations were made based on the findings of this study:

1. further studies should be carried out on the anti-nutritional composition of the seeds and leaves of *Ocimum gratissimum* to help the general public know their safe limits or levels.
2. home makers should be encouraged to incorporate *Ocimum gratissimum* seeds and leave flour into recipes such as cakes, drinks, biscuits and food preparations to prevent nutrient deficiencies.
3. nutrition education programmes should be mounted in communities on the utilization of basil leaves and seeds in the prevention and management of nutrition-related diseases.

References

Adepoju, O. T., Adediji R. A., & Adigwe P. C. (2012). Nutrient composition and micronutrient potential of fresh and processed leaf and tree of basil (ocimum gratissimum). *African Journal of Medicine and Medical Sciences,* 41(1):10-19.https://www.researchgate.net/publication/267328672

American Diabetes Association (2013). Diagnosis and classification of diabetes mellitus. Diabetes Care, 36:S67–74. https://doi.org/10.2337/dc13-s067. doi: 10.2337/diabetes care13-S067

Ahaotu, E.O., & Lawal M. (2019). Determination of proximate and minerals content of Turmeric (Curcuma longa Linn) leaves and rhizomes. *Journal of Food, Nutrition and Packaging*, *6*: 01-04. https://www.jakraya.com.

Akinmoladun, A. C. Ibukun, E. O., Afor, E., Obuotor E. M., & Farombi E.O. (2007). Phytochemical constituent and antioxidant activity of extract from the leaves of *Ocimumgratissimum*. *Scientific Research and Essay* 2 (5), 163-166. Available online at http://www.academicjournals.org.

Amit, K. & Priyadarsini, K. I. (2011). Free radicals, oxidative stress and importance of antioxidants in human health. *Journal of Medical and Allied Sciences* 1(2):53–60. https://www.researchgate.net/publication/285070929

Association of official analytical chemists (AOAC) (2010). *Official Methods of Analysis of Association of Analytical Chemists.* 18th edition, Washington, DC, USA. https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje.

Awah F. M. & Verla,A. W. (2010). Antioxidant activity, nitric oxide scavenging activity and phenolic contents of *Ocimum gratissimum* leaf extract. *Journal of Medicinal Plants Research;*4(24), pp. 2479-2487. http://www.academicjournals.org

Bravo, H.C., Céspedes, N.V., Zura-Bravo, L., & Muñoz, L.A. (2021). Basil seeds as a novel food, source of nutrients and functional ingredients with beneficial properties: A Review. *Foods* 10 (7): 1467.doi: 10.3390/foods10071467.https://doi.org/10.3390/foods10071467

Chinedu, I., Ojochenemi E. Y., Nkeiruka G. I., Ifeoma S. U., Silas V. T., & Ogochukwu J. O. (2018). Proximate mineral and phytochemical composition of *Piper Guineense* seeds and leaves. *Journal of Biological Science,* 18 (7): 329-337. DOI10.3923/jbs.2018.329.337

Cohen M. M. (2014). Tulsi - Ocimum sanctum: A herb for all reasons. *Journal of Ayurveda and Integrative Medicine*, 5(4):251-259.doi:10.4103/0975-9476.146554

Duyff, R.L. (2017). *Academy of nutrition and dietetics complete food and nutrition guide. Fifth edition*. Boston: Houghton Mifflin

Harcourt.https://archive.org/details/academyofnutriti0000duyf

Egata, D.F.(2021). Benefits and use of sweet basil (Ocimum basilicumL.) in Ethiopia: a review. *Journal of Nutrition and Food Processing*.4(5):57-9. doi:10.31579/2637-8914/057.

Gibney, M. J., Lanham-New, S. A., & Cassidy, Aedin, & Hester,V. H. (2009). *Introduction to human nutrition* (The Nutrition Society Textbook), second ed. Wiley-Blackwell. British 1387.doi: https://doi.org/10.1017/S0007114509991759

Graf, D., Di Cagno, R., Fåk, F., Flint, H.J., Nyman, M., Saarela, M., & Watzl, B. (2015). Contribution of diet to the composition of the human gut microbiota. *Microbial. Ecological. Health and Diseases Journal*. 4(26), 26164 . https://doi.org/10.3402/mehd.v26.26164.

Francesco, B., Anna, L, Stineke, O., Victor, A., Gunhild, S., Ruth, R., Mario, A., & Ashkan, A. (2019). Transforming the food system to fight non-communicable diseases. *The British Medical Journal;* 364:l296.https://www.bmj.com/content/bmj/364/bmj.l296.

Hamid A.A., Aiyelaagbe O.O., Usman L.A., Ameen O.M., & Lawal A. (2010) Antioxidants: its medicinal and pharmacological applications. *African Journal of Pure and Applied Chemistry* 4(8):142–151. https://www.semanticscholar.org/paper/Antioxidants

Hajmohammadi, A., Pirouzifard, M., Shahedi, M., & Alizadeh, M. (2016). Enrichment of a fruit-based beverage in dietary fiber using basil seed: Effect of Carboxymethyl cellulose and Gum Tragacanth on stability. *Lebensmittel-Wissenschaft & Technologie* . 74:84–91. https://doi.org/10.1016/j.lwt.2016.07.033

Ijeh I.I., Njoku O.U.,& Ekenza E.C. (2004). Medicinal evaluation of *Xylopia aethiopica* and *Ocimum gratissimum*: *Journal of MedicinalAromatic Science*, 26(1): 44-47.https://www.researchgate.net/publication/284656090

Ishola, I.S., Adegoke, A.E., & Bola, A.A. (2017).Comparative study of condiment vegetable basil leaf (Ocimum gratissimum) and bitter leaf (Vernonia Amygdalina).*American Journal of Food and Nutrition,*5(3) 95-98.https://doi.org/10.12691/AJFN-5-3-3

Jakutowicz, k., Tomick, Z., & Leokadia,l (1997). Determination of total plasma tocopherol in thepresence of carotenes. *Polskie Archiwu Hydrobiologii* 20:45-57.https://doi.org/10.1002%2Ffsn3.31

Johnson & Melissa. (2015). The Role of the food and nutritional sciences in examining the dterminants of health. *Food and Nutrition Report* 1(1): 27-29. doi: https://doi.org/10.24218/fnr.2015.05.

Keim N.L., Levin R.J., & Havel P.J. (2014). *Carbohydrates***.**In: Ross A.C., Caballero B., Cousins R.J., Tucker K.L., Ziegler T.R., editors. Modern Nutrition in health and disease. 11th edition. Philadelphia: Lippincott Williams & Wilkins; 36-57.https://pure.psu.edu/en/publications/modern-nutrition-in-health-and-disease

Keith W. S. (2018). Basil: A brief summary of potential health benefits. *Nutrition Today*; 53(2): 92-97.http://dx.doi.org/10.1097/NT.0000000000000267

Mgbeje B. I. A., Umoh E. U. & Ekpe O.(2019). Comparative proximate, vitamin and mineral composition of leaves of four selected tropical vgetable plants namely: *Ocimum gratissimum*, *Piper guineense*, *Gongronema latifolium* and*Vernonia amygdalina. European*

Journal of Nutrition & Food Safety. 10(1): 84-93http://dx.doi.org/10.9734/ejnfs/2019/v10i130100.

Munir,, M., Qayyum A., Raza S., Siddiqui, N.R., Mumtaz, A., Safdar, N., Shible, S., Afzal, S., & Bashir S. (2017). Nutritional assessment of basil seed and its utilization in development of value added beverage. *Pakistian Journal of Agricultural Resources.*; 30:266–271. http://dx.doi.org/10.17582/journal.pjar/2017.30.3.266.271

Naji-Tabasi, S., & Razavi, S.M.A. (2017). Functional properties and applications of basil seed gum: An overview. *Food Hydrocolloid* 73:313–325. http://dx.doi.org/10.1016/j.foodhyd.2017.07.007

Nazir S., Wani I.A., & Masoodi F.A.(2017). Extraction optimization of mucilage from basil (*Ocimum basilicum* L.) seeds using response surface methodology. *Journal of Advance. Resources*. 8:235–244.

Njoku, O. U., Joshua, P. E., Agu, C. V., and Dim, N. C. (2011). Antioxidant Properties of *Ocimum gratissimum* (scent leaf). *New York Science Journal*; 4(5). https://www.researchgate.net/publication/269335752.

Olumide, M. D., Ajayi, O. A. &. Akinboye, O. E. (2019). Comparative study of proximate, .mineral and phytochemical analysis of the leaves of *Ocimum gratissimum, Vernonia amygdalina and Moringa oleifera*. *Journal of Medicinal Plants Research*. 13(15), 351-356. http://dx.doi.org/10.5897/JMPR2019.6775

Omodamiro O. D. & Jimoh M. A. (2015). Antioxidant and antibacterial activities of *Ocimum gratissimumAmerican Journal of Phytomedics and Clinical Therapeutics*. 3(1):10-19.www.ajpct.org

Pandey, M., Abidi, A. B., Sadhana, S. & Singh, R. P. (2006). Nutrition evaluation of leafy vegetable parantha. *Journal of Human Ecology*, 19, 155-156.http://dx.doi.org/10.1080/09709274.2006.11905871

Rabizadeh, F, Mirian, M.S., Doosti, R.,Kiani-Anbouhi, R & Eftekhari, E.(2022) **.** Phytochemical classification of medicinal plants used in the treatment of kidney disease based on traditional Persian medicine, *Evidience Based Complement Alternative Meicine*. : 8022599.https://doi.org/10.1155%2F2022%2F8022599

Ranjha, M.A.N., Amjad, S., Ashraf, S., Khawar, L., Safdar. M.N., Jabbar, S., Nadeem, M., Mahmood, S. & Murtaza M.A. (2020). Extraction of polyphenols from apple and pomegranate peels employing different extraction techniques for the development of functional date bars. *International Journal of Fruit Science*.;20:1201–1221. https://www.tandfonline.com/doi/full/10.1080/15538362.2020.1782804

Reichardt, K., & Timm, L. C. (2020). Water, the universal solvent for life. *Soil, Plant and Atmosphere* (pp.7-13).http://dx.doi.org/10.1007/978-3-030-19322-5_2

Rezapour R., Ghiassi Tarzi B., & Movahed S. (2016). The effect of adding sweet Basil seed powder (Ocimum basilicum L.) on rheological properties and staling of baguette bread. *Journal of Food Bioscience and Technology*.6:41–46. https://www.researchgate.net/publication/336316069

Shuaib O. R., Adeniran O. I., Musah M., Yerima H., Sani H., & Amusat K., 2015. Comparative nutritional and anti nutritional analysis of *Ocimum gratissimum* and *Basilicum.* Academia Arena, 7(7).http://www.sciencepub.net/academia

Tarayrah, H., Akkawi, M., & Yaghmour, R. (2022). Investigations of the Palestinian medicinal plant Basil (Ocimum basilicum): antioxidant,

antimicrobial activities, and their phase behavior. *Pharmacology International Journal*. 10(3):97-104. https://www.researchgate.net/publication/363632659

Traber MG, & Atkinson JC. (2007). Vitamin E, antioxidants and nothing more. *Free Ecological Biology and Medicine.* 43(1): 4-15.https://pubmed.ncbi.nlm. nih.gov/17561088

Uhegbu, F.O. Elekwa,I., Akubugwo, E. I. Godwin C. C. & Iweala, E.J. (2012). Analgesic and hepatoprotective activity of methanolic leaf extract of *Ocimum gratissimum* (L.) *Research Journal of Medicinal Plant*, 6(1):108-115.https://scialert.net/abstract/?doi=rjmp.2012.108.115

World Health Organisation (WHO) (2002). *Reducing risk and promoting healthy life. Micro and secondary nutrient research in India*. World Health Organization Report—2002, WHO: Geneva, Switzerland. https://pubmed.ncbi.nlm.nih.gov/14741909

World Health Organisation (WHO) (2017). *Non-communicable diseases*: the *slow motion disaster.* Geneva: Switzerland.https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

World Health Organisation (WHO) (2022*). World health statistics. monitoring health for the SDGs, sustainable development goals.* Geneva, Switzerland. http://apps.who.int/iris

Zahran, E.M., Abdelmohsen, U.R., Khalil, H.E., Desoukey, S.Y., Fouad, M.A.,& Kamel, M.S. (2020).Diversity, phytochemical and medicinal potential of the genus *Ocimum* L. (Lamiaceae) *Phytochemical Reviews.*;19:907–953. https://doi.org/10.1007/s11101-020-09690

.

Emotional Abuse among Secondary School Students in Igumale Community, Benue State, Nigeria: A Cross-sectional Survey

Elufidipe-Olumide, H. A[1], Ozoko, M[1], Dike, F[2, 3], & Ononuju, A. H[1]
[1]Department of Human Kinetics & Health Education, University of Nigeria Nsukka.
[2]Department of Social Science Education, University of Nigeria Nsukka
[3]Institute of Education, University of Nigeria Nsukka

Corresponding Author: felix.dike@unn.edu.ng

Abstract

Abuse against children particularly emotional abuse is a serious unnoticed public health issue requiring thoughtfulness as it negatively affects the developmental milestones of the growing child. The study aimed to determine the prevalence of emotional abuse and the significant difference in the prevalence of emotionally abused students based on age, gender and parents' level of education. A cross-sectional research design was adopted for the study. The population of the study consisted of 800 students from two public and four private secondary schools in Igumale community. A sample size of 300 students was selected using a multi-stage sampling procedure. Two research questions and three null hypotheses guided the study. A structured questionnaire was used to collect data. Data collected were coded and entered into SPSS version 22 for analysis. The research questions were answered using frequency and percentage while chi-square statistics was used to test the null hypothesis at a .05 level of significance. Results show that 51.0% proportion of secondary school students experienced emotional abuse. There was no significant association in the emotional abuse experienced by secondary school students based on gender and age and not parents' level of education. The study recommends greater investments in programs to stop and report child abuse emphatically emotional abuse.

Keywords: Emotional Abuse, Adolescents, Secondary Schools, Students, Benue State.

Introduction

Abuse against children particularly emotional abuse is a serious yet unnoticed public health issue that requires intervention. This is because it negatively affects the developmental milestones of the growing child. There is a rise in the proportion of abused children both in developed and developing nations. Hillset. al (2016) posited that globally, it is estimated that up to 1 billion children aged 2–17 years, have experienced physical, sexual, or emotional violence or neglect in the past year. Recent abuse reports globally show that violence against children is an epidemic of abuse and

that over one billion children experience violence every year, with devastating short and long-term consequences including injury and death of thousands of children each year (Global Report, 2021). Widespread child abuse exists across East Asia and Pacific Regions with 17 %- 35% prevalence for both girls and boys respectively while the prevalence estimates for emotional abuse range from 18-41.6%, showing a wide range across countries in the region (UNICEF, 2014). In Africa, cases of child abuse are documented in the literature. In East African countries, there is an extensive report of incidences of child abuse especially through the media. Tanzania, Uganda and Kenya are not left out as the abuse includes child battering and domestic fights which have adverse effects on children's well-being (Devaney, 2015). Child abuse is not isolated to particular social groups or areas however, it is rampant in many of the world's poorer countries and even more so in Nigeria (Okooboh, 2016). A report by UNICEF (2014) indicated 47% level of child abuse with vulnerability to negative consequences. Oladosu, et. al (2021) reported that 100% of the respondents in their study experienced domestic abuse in the past year. UNICEF (2017) reported that abuse in all its forms is a daily reality for many Nigerian children and only a fraction ever receive help. UNICEF further reported that six out of every 10 children experience some form of violence in Nigeria and that Nigeria has the largest number of child brides in Africa with more than 23 million girls and women who were married as children, most of them from poor and rural communities. Abuse exists in different forms and anyone can be abused. World Health Organization (2007) highlighted forms of child abuse to include physical and emotional ill-treatment, sexual abuse, neglect and exploitation that results in actual or potential harm to the child's health, development or dignity. This study focused on emotional abuse because emotional abuse is subtle in nature, appears to be ignored and goes mostly unnoticed. Emotional maltreatment of a child is the most challenging form of child abuse and neglect because it is more subtle to detect (Dye, 2019). Emotional abuse can be allusive, and its very nature allows it to hide in plain sight (Hart and Glaser, 2011). Emotional abuse is perhaps the most damaging type of abuse, that leads to long-term consequences (Heim et.al., 2013). Thus, the a need to understudy the prevalence of emotional child abuse among secondary school students in the Ado community. Emotional abuse also referred to as psychological abuse, is the persistent emotional maltreatment of a child in such a way as to cause adverse effects on the child's emotional development (Devon Children and Family Partnership, 2023; Oxfordshire Safeguarding Children Board, 2023). It can be in the form of humiliating a victim a family member privately or publicly, controlling what the victim can and cannot do, withholding information from the victim, or deliberately doing something to make the victim feel diminished or embarrassed. It also involves isolating the child from friends and family,

implicitly blackmailing the victim by harming others when the victim expresses independence or happiness. According to Adeboye, et al.(2021), emotional abuse is non-contact violence including verbal and non-verbal behaviours resulting in emotional, social, cognitive and somatic consequences in functioning and adjustment. Contextually, emotional child abuse is emotional maltreatment including non-verbal behaviours, deprivations, and age-inappropriate expectations from parents and other significant others that have long-lasting effects on the emotional development of the secondary school student. It is important to note that the persistent emotional abuse of a child causes serious damage to mental health and wellbeing with devastating and long-lasting effects on a child's emotional health and development. Umah (2021**)** asserted that emotional abuse is often covered and masked as moral training and cultural norms. In a Cohort study, Kisely, et.al (2018) observed that emotional abuse was the most common form of child abuse. Kurtz, et. al, (2022) reported the average prevalence recorded by the MIC study was as high as 57.8 % for females and 59.2 % for male children in Africa. In Nigeria, the 2014 Nigeria Violence Against Children Survey (VACS) found that 17% of girls and 20% of boys experienced emotional abuse from a parent, caregiver or adult relative (National Population Commission of Nigeria, 2016).

Emotional abuse is associated with risk-taking behaviours including higher rates of suicidal behaviours, alcohol misuse, infrequent use of condoms by males, and multiple sexual partners in the past 12 months in females (Christoffersen et al., 2010; Annor, 2020). Emotional abuse is assumed to be present in all other forms of abuse, though it can stand out as well. It consists of any attitude or behaviour which interferes with a child's mental health or social development, such as yelling, screaming, name-calling, shaming, negative comparisons to others, and telling children they are bad or not good. Emotional abuse of students by teachers can be in different forms and with peculiar characteristics. They include rejecting, isolating, discriminating, degrading, terrorizing, dominating, ignoring and verbally assaulting children. Discrimination against children in the classroom can be perpetrated by teachers, when they are very selective in assigning tasks to students (Aluede et. al, 2012). In the school setting, where teaching and learning take place, the importance of children's mental health should not be underestimated (Aluede, et. al 2012). Emotional abuse abounds in homes, schools, and religious groups and is merely seen as a family, school, or religious issue whereas it is a gross criminal offence (Umah, 2021). This is why inadequate training of teachers and poor supervision of schools have left many students emotionally abused with no reaction from parents. Often, parents consider emotional abuse as a training process and as such condone it, thus, making it difficult for children to identify and process their own

emotions or those of others. WHO (2022) averred that when abuse becomes chronic, it results in toxic stress with adverse effects on brain development and increased risk for posttraumatic stress disorder, learning, attention, memory and immediate physical injuries in addition to emotional problems, such as anxiety. Long-term effects of abuse include increased risk of experiencing future violence, victimization, substance abuse, sexually transmitted infections, lower educational attainment, and limited employment opportunities. Stoltenborgh (2015) observed that child maltreatment has predominantly been focused on sexual abuse, with far less attention paid to psychological maltreatment (emotional abuse) and that child maltreatment, particularly psychological maltreatment, is associated with a broad range of negative long-term health and developmental negative outcomes extending into adolescence and young adulthood. The study concluded that the overall quality of life was lower for those who had experienced emotional abuse and neglect but not for those who had experienced physical or sexual abuse. The implication is that emotional abuse has more effect on the child than other types of abuse.

Emotional abuse can affect the psychological development of secondary school students, which could make them develop unusual or negative behaviours such as bullying, aggression, isolation, abnormal fear, depression, anxiety, higher levelss of anger and/or disobedience, and drug abuse. Individual child's responses towards child abuse depend on many factors such as age, gender, parents' level of education and the family environment (Holt, et. al, 2018). George and Okoye (2021) found that age and parents' education level were significantly associated with emotional abuse among adolescents. Agu (2021) reported gender and age differences in the experience of emotional abuse among secondary school students. Also, Mba (2022) found an association between parents' education level and emotional abuse of students,

The home is where the children find their happiness and spend a lot of time with their families. Children should be given adequate love, care, support and protection in order not to experience or witness abuse from their parents or caregivers. However, adolescents including secondary school students seem to be exposed to emotional abuse across the country. In Nigeria, there are limited facilities for emotionally abused children to receive the psychological services necessary for emotional healing and growth. Emotional abuse can be more dangerous to the child's welfare than other forms of abuse, as it negatively affects the child's self-esteem and self-image, causing devastating, life-long consequences. The researchers observed that there is limited empirical evidence on the prevalence of emotional abuse among secondary school students in Igumale local government area of Benue State. This study, therefore, aims at filling this gap.

Research questions

The following questions guided the study:

1. What is the prevalence of emotional abuse among secondary school students in Igumale local government?
2. What is the prevalence of emotional abuse based on age, gender and parents' education level?

Hypotheses

The study hypothesizes that:

$H_0$1. Emotional abuse is not significantly associated with the age of the respondents.

$H_0$2. Emotional abuse is not significantly associated with the gender of the respondents.

$H_0$3. Emotional abuse is not significantly associated with the parent's education level.

Methodology

***Study Design*:** The study adopted the cross-sectional research survey design.

***Study Population*:** The study was conducted in Igumale community which is one of the five districts in Ado LGA of Benue State. The population for the study comprised 800 secondary school students from six (two public and four private) secondary schools in Igumale Community (Post Primary Education Board, Ado LGA, Benue State).

***Study Sample Size and Sampling Technique*:** The sample size for the study was 300 respondents out of 800 students in Igumale community, selected using a two-staged sampling technique. In the first stage, two private schools were randomly selected in addition to the only two public schools in the study area. The selection of only two private schools was to give an equal representation of the two types of schools. This gave a total of four schools that participated in the study. The second stage involved a random selection of 300 secondary school students from the selected four schools. Students who were in Junior Secondary 3 and Senior Secondary 3 were excluded from the study because they were preparing for external examinations and did not have the time to participate in the study.

***Instrument for Data Collection*:** The instrument for data collection was a questionnaire titled "Prevalence of Child Abuse Questionnaire (PCAQ), comprising 15 items. The PCAQ is divided into two sections; A and B. Section A contains 3 items on personal information such as age group, gender and parent level of education with varied response options. Section B contains five items that test for emotional abuse among the respondents and has two response options of Yes and No.

***Validity and Reliability of the instrument*:** Face validity of the instrument was carried out by three experts from the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka. The reliability of the instrument was calculated using the Split-half method of reliability. After computations, a reliability coefficient of .842 was obtained for the instrument and was adjudged appropriate for the study based on Cohen et.al. (2011) guidelines.

***Method of Data Collection*:** The researchers went to the selected schools

and obtained permission from each of the principals of the schools to conduct the study. Teachers were briefed on the essence of the study and they helped in the distribution of the questionnaire to the respondents. Three hundred and twenty-five (325) copies of the questionnaire were hand-distributed to the respondents for a period of four days. Three hundred and ten (310) copies were returned giving a return rate of 95.4%. However, ten copies of the questionnaire were not properly filled out and were removed. Only 300 copies were viable and used for analysis.

***Method of Data Analysis*:** The data from copies of PCAQ were coded and analyzed using the International Business Machine Statistical Package for Social Sciences, IBM-SPSS (version 22). The research question on the prevalence of emotional abuse and the prevalence of emotional abuse based on age, gender and parents' education level were analysed using frequencies and percentages while the null hypotheses were tested using the Chi-square statistics at a .05 level of significance. Cluster means were analysed by obtaining the grand mean percentage of each variable considered.

Results

Data on the socio-demographic characteristics of the respondents (Table 1) show that 43.0% were males while 57.0% were females, 56.7% were aged 10 – 14 years and 43.3% were aged 15-19 years. A good proportion (36.3%) of the respondents had parents with no formal education, 26.0% of the parents had primary education, 17.3% had secondary education and 20.3% had tertiary education.

Table1:Socio-demographic information of respondents

Socio-demographics	f	%
Gender		
Male	129	43.0
Female	171	57.0
Age		
10-14 years	170	56.7
15-19 years	130	43.3
Parents' Level of Education		
No formal Education	109	36.3
Primary Education	78	26.0
Secondary Education	52	17.3
Tertiary Education	61	20.3

Table 2 shows that among secondary school students, slightly more than half (54.2%) experienced emotional abuse while 45.8% did not experience emotional abuse. The table further shows that a very high proportion (92.3 %) of students have experienced being locked up in an enclosure such as a toilet. Many (60.7%) have been forced to do something bad against their will, 43.7% have been constantly ignored by teachers, 39.3% experienced constant ridicule, and 35.0% have been constantly humiliated.

Table 2: **Prevalence of emotional abuse among the respondents (n=300)**

Emotional abuse	Yes	No

	f (%)	*f* (%)
Have your parents/siblings ever locked you up in an enclosure such as a toilet?	277 (92.3)	23 (7.7)
Have you ever been constantly ridiculed by your mates?	118 (39.3)	182 (60.7)
Have you been constantly ignored by the teachers in your school?	131 (43.7)	169 (56.3)
Have you ever been threatened by a classmate /teacher to do something bad, against your will?	182 (60.7)	118 (39.3)
Have you been constantly humiliated in your school or at home?	105 (35.0)	195 (65.0)
Cluster %	**54.2**	**45.8**

Table 3 shows that 55.6% of secondary school students aged 10-14 years experienced emotional child abuse while 52.3% of secondary school students aged 15-19 years experienced emotional abuse. Based on gender, 55.1% of males and 53.5% of females experienced emotional abuse. Based on parents' educational status, 56.3% of those whose parents had no formal education. 50.2% of those whose parents had primary education, 61.9% of those whose parents had secondary education and 48.8% of those whose parents had tertiary education experienced emotional abuse respectively.

Table 3: Prevalence of emotional abuse based on age, gender and parents' educational status (n=300)

	Age		**Gender**		**Parents' Educational Status**			
	10-14yrs (n=170) f (%)	**15-19yrs (n=130) f (%)**	**Male (n=129) f(%)**	**Female (n=171) f(%)**	**NFE (n=109) f (%)**	**PE (n=78) f (%)**	**SE (n=52) f (%)**	**TE (n=61) f (%)**
Have your parents/siblings ever locked you up in an enclosure such as a toilet?	169 (99.4)	108 (83.1)	122 (94.6)	155 (90.6)	103 (94.5)	78 (100.0)	50 (96.2)	46 (75.4)
Have you ever been constantly ridiculed by your mates?	60 (35.3)	58 (44.6)	44 (34.1)	74 (43.3)	45 (41.3)	23 (29.5)	24 (46.2)	26 (42.6)
Have you been constantly ignored by the teachers in your school?	76 (44.7)	55 (42.3)	62 (48.1)	69 (40.4)	48 (44.0)	32 (41.0)	22 (42.3)	29 (47.5)
Have you ever been threatened by a classmate /teacher to do	103 (60.6)	79 (60.8)	77 (59.7)	105 (61.4)	71 (65.1)	38 (48.7)	41 (78.8)	32 (52.5)

something against your will?								
Have you been constantly humiliated in your school or at home?	65 (38.2)	40 (30.8)	50 (38.8)	55 (32.2)	40 (36.7)	25 (32.1)	24 (46.2)	16 (26.2)
Cluster %	**55.6**	**52.3**	**55.1**	**53.5**	**56.3**	**50.2**	**61.9**	**48.8**

NFE= No Formal Education, PE= Primary Education, SE= Secondary Education, TE= Tertiary Education

Table 4 shows that emotional abuse was significantly associated with parents' level of education (($\varkappa^2$ =.13.483, df =1, = *.04),* but not with age ($\varkappa^2$ =.592, df =1. *P = .442)* and gender (($\varkappa^2$ =.965, df =1., p= *.326)*. Hypotheses 1 and 2 are not rejected while hypothesis 3 is rejected.

Table 4: **Association of emotional abuse with age, gender and parental level of education (n=300)**

Variable	**N**	**Yes f (%)**	**No f (%)**	$\chi 2$	**Df**	**p-value**	**Decision**
Age							
10-14years	170	95 (55.6)	75 (44.1)	.592	1	.442	Not
15-19years	130	70 (52.3)	60 (46.2)				significant
Gender							
Male	129	71 (55.1)	58 (44.9)				Not
Female	171	91 (53.5)	80 (46.8)	.965	1	.326	significant
Parental level of education	109	61 (56.3)	48 (44.0)				
No formal education	78	40 (50.2)	38 (48.7)				
Primary education	52	32 (61.9)	20 (38.5)	13.483	3	0.04*	Significant
Secondary education	61	29(48.8)	32 (54.5)				
Tertiary education							

Discussion of Findings

The findings of the study show a high prevalence of emotional abuse among students in Igumale. The finding was expected and therefore not surprising because cases of emotional abuse of children have been reported in the media. UNICEF (2017) reportedly stated that abuse in all its forms is a daily reality for many Nigerian children. Furthermore, emotional abuse abounds in homes, schools, and religious groups and is merely treated as a minor issue rather than a gross criminal offence (Umah, 2021). The study found that a good number of the students indicated being locked up in an enclosure, threatened, and constantly ignored. This finding agrees with the assertion that emotional abuse is the failure to provide the affection and support necessary for the development of a child's well-being, such as ignoring, withdrawal of

attention, lack of praise, and lack of positive reinforcement (Aluede, et al., 2012; Akoloh et al., 2016). These findings imply that as students become withdrawn due to emotional abuse, they feel unwanted and unaccepted. This may lead to a feeling of worthlessness, loneliness, poor academic performance, drug misuse and abuse, sexual experimentation, depression, suicide, and living unproductive and unfulfilling life during adulthood. The findings also imply that abused secondary school students may not develop objective reasoning, may become aggressive and randomly transfer aggression to other people, and may become future abusers (Dye, 2019). These may have adverse effects on national development as many talents and abilities that should have been harnessed for national development are left undirected which may lead to decadence in the society. The study also found that a higher proportion (55.6%) of students within the age range of 10-14 years and male students (55.1%) reported emotional abuse, than their counterparts. This finding agrees with the report that more male students within 10-15 years than female students experienced emotional abuse from a parent, caregiver or adult relative (National Population Commission of Nigeria, 2016). The study further indicated that a very high proportion of students whose parents had secondary education and those whose parents had no formal education reported emotional abuse. The reason could be that the more educated parents are enlightened enough to protect and care for their children emotionally and may be able to understand different developmental changes in their children. This makes them better equipped to build an emotionally stable family where children feel safe, wanted and understood. The finding also agrees with the assertion of Holt et al. (2018) that individual children's responses towards child abuse depend on such factors as age, gender, parents' level of education and the child-rearing environment.

The findings show that the null hypothesis which expected that emotional abuse will not be associated with the age of the students was not rejected. This implies that statistically, secondary school students who experience emotional abuse do not differ significantly based on their age and gender. The finding contradicts that of Karakurt and Silver (2013) who reported that age is significantly correlated with emotional abuse among their study participants, with younger participants experiencing more emotional abuse than older ones. The finding also contradicts the findings of George and Okoye (2021) in which there is a statistically significant difference in the proportion of in-school adolescents that experienced emotional abuse based on age. Gender was not found a significant factor in emotional abuse in this study. This finding disagrees with the report of Agu (2021) that gender and age differences exist in the experience of emotional abuse among secondary school students. Further findings of this study showed that the hypothesis

of no significant association between the emotional abuse experienced by secondary school students and parents' level of education was rejected. This implies that parental education level had a significant association with the emotional abuse among students. This finding agrees with that of Mba (2022) who reported an association between parents' education level and emotional abuse among students.

Limitations of the Study

The study was conducted in a single location among a few schools. This limits the generalizability of the findings of the study.

Conclusion

The findings of the study show that emotional child abuse is prevalent among the students in Igunmale community. Emotional abuse was not significantly associated with the age and gender of the students but was associated with their parents' education level. These imply that children may experience emotional abuse irrespective of their age and gender. However, parental level of education could make a significant difference in emotional abuse among children. Children with highly educated parents are less at risk of abuse than children of parents with little or no education. This highlights the role of parental education in minimizing emotional child abuse among secondary school students.

Recommendations

The study recommendations were that educational institutions and other relevant agencies responsible for children's welfare, such as NGOs should make;

1. greater investments in programs that have been proven to stop the abuse -such as family counselling and home visits.
2. considerations for managing a prevention program, including community needs assessment, collaborating with community partners, family engagement and retention, cultural competence, training, and funding.

References

Adeboye, A.A., Ajiboye, S. K ., Bolu-Steve, F. N., & Oniemola, R .F. (2021). Incidence of emotional abuse as expressed by secondary school students in Kwara State. Al-Hikmah *Journal of Educational Management and Counselling, 3* (1), 44-52.

Akoloh, Okenjom, G . P, & Obiahu, C. L. (2016). The effect of child abuse on youths and their academic performance in secondary schools in Bayelsa State, Nigeria. *Greener Journal of Educational Research 6(4*)170-176https://www.gjournals.org/GJER/archive/june-2016-vol-64/akoloh-et-al.html

Aluede, O., Ojugo, A. I., & Okoza, J. (2012).Emotional abuse of secondary school students by teachers in Edo State, Nigeria. *Research in Education*, *88*(1), 29–39. https://doi.org/10.7227/RIE.88.1.3

Annor, F. B., Gilbert, L. K., Davila, E. P., Massetti, G. M., Kress, H., Onotu, D., & Ogbanufe, O. (2020). Emotional violence in childhood and health conditions, risk-taking behaviors, and violence perpetration among young adults in Nigeria. *Child abuse &*

neglect, *106*, 104510.https://doi.org/10.1016/j.chiabu.2020.104510

Christoffersen, M. N., Diane, D. J. J.o. C., & Trauma, A. (2010). Psychological maltreatment and adolescents' suicidal behavior: A nationwide sample of 1,055 children at risk. *Journal of Child & Adolescent Trauma, 3(*2), 109–124. https://doi.org/10.1080/19361521003761242.

Dye, H. L. (2019). Is Emotional abuse as harmful as physical and/or sexual abuse?. *Journal of child & adolescent trauma*, 13(4); 399–407. https://doi.org/10.1007/s40653-019-00292-y

Devaney, J, (2015). Understanding domestic abuse and sexual abuse: prevalence, policy and practice in Healy. NY: Routledge

Devon Children and Family Partnership (2023). Emotional abuse. https://www.dcfp.org.uk/child-abuse/emotional-abuse/

Global Report (2021). Prohibiting all corporal punishment of children: laying the foundations for non-violent childhoods. Published by Global Partnership to End Violence Against Children. Retrieved from Global report 2021 | Global Initiative to End All Corporal Punishment of Children (endcorporalpunishment.org).

Hart, S. N., & Glaser, D. (2011). Psychological maltreatment—Maltreatment of the mind: A catalyst for advancing child protection toward proactive primary prevention and promotion of personal wellbeing. *Child Abuse & Neglect, 35*, 758–766. doi:10.1016/j.chiabu.2011 .06.002.

Heim, C. M, Mayberg, H. S, Mletzko, T, Nemeroff, C. B, Pruessner, J. C. (2013). Decreased cortical representation of genital somatosensory field after childhood sexual abuse. *The American Journal of Psychiatry,*170(6):616–623. doi: 10.1176/appi.ajp.2013.12070950.

Hills, S., Mercy, J., Amobi, A. & Kress, H. (2016). Global prevalence of past-year violence against children: a systematic review and minimum estimates. *Pediatrics, 137* (3): https://doi.org/10.1542/peds.2015-4079. e20154079 .

Holt, S., Buckley, H., & Whelan, S. (2018). The impact of exposure to child abuse on children and young people: A review of the literature. *Child Abuse &Neglect, 32* (8), 797-810.

Karakurt, G. & Silver, K. E. (2013). Emotional abuse in intimate relationship: the role of gender and age. *Violence and Victims, 28* (5), 804-821. Doi.org/10.1891/0886-6708.vv-d-12-00041

Kisely, S., Abajobir, A. A., Mills, R., Strathearn, L., Clavarino, A. & Najman, J. M. (2018). Maltreatment and mental health problems in adulthood: birth cohort study. *The British Journal of Psychiatry 213*, 698–703. doi: 10.1192/bjp.2018.207

Mba, M. A. (2022). Emotional abuse in childhood and suicidality: The mediating roles of re-victimization and depressive symptoms in adulthood. *Child Abuse & Neglect, 44*, 130–139. https://doi.org/10.1016/j.chiabu.2015.03.016.

National Population Commission of Nigeria (2016). *Violence against children in Nigeria: Findings from a national survey, 2014*. Retrieved from UNICEFU.N., US Centers for Disease Control and Prevention.

Okooboh, J. (2016, December 20), Child abuse in Nigeria: The barking but not biting laws.AvailableatSSRN: https://ssrn.com/abstract=3099350 or http://dx.doi.org/10.2139/ssrn.3099350

Oladosu, A., Abiodun, O., &Tunde-Ayinmode, M. (2021). Prevalence and

pattern of emotional abuse of children in their homes; self reported experience of children in Ilorin Nigeria. *European Psychiatry*, *64*(Suppl 1), S713–S714.https://doi.org/10.1192/j.eurpsy.2021.1890

Oxfordshire Safeguarding Children Board (2023) Emotional abuse. https://www.oscb.org.uk/safeguarding-themes/emotional-abuse/

George, A. K., , &Okoye V. N. (2021).Age and gender differential in childhood emotional abuse, negative emotion-driven impulsivity, and alcohol use in young adulthood. *Child Abuse &Neglect*, *50*, 94–103.https://doi.org/10.1016/j.chiabu.2015.02.010

Stoltenborgh M, Bakermans-Kranenburg, M. J, Alink, L. R. A., & IJzendoorn, M. H. (2015). The prevalence of child maltreatment across the globe: Review of a series of meta-analyses. *Child Abuse Review,* 24(1):37–50. https://doi.org/10.1002/car.2353

Umah, O. (2021) Emotional abuse is a crime. *Daily Law Tips*. Retrieved from https://thenigerialawyer.com/emotional-abuse-is-a-crime/

UNICEF; Accra: 2014. Child protection baseline research report.United Nations Children Fund-UNICEF (2017). A familiar face: Abuse in the lives of children and adolescents. Child Protection | UNICEF Nigeria

World Health Organisation (WHO) (2020). Gender. Factsheet. Geneva, Switzerland. https://www.who.int/health-topics/gender

J. of Family and Society Research 2 (2), December 2023, pp. 157 - 171

The Role of Clothing and Textile in Poverty Alleviation among Women in Abakaliki Local Government Area

Elobe-Mbam, S.C.[1] & Oluah, B. E.[1]
[1]Department of Home Science and Management,
University of Nigeria, Nsukka

Correspondence: scholasticaelobembam@gmail.com

Abstract

This study identified the roles of clothing and textiles-related occupations in poverty alleviation among women in the Abakaliki Local Government Area. The study was guided by three objectives. A descriptive cross-sectional survey design was employed in a population of 555. A proportionate stratification sampling method was employed in the selection of 228 women from seven districts in the area who formed the sample size for the study. The instrument for data collection was a structured questionnaire titled "Roles of Clothing and Textiles Related Occupations in Poverty Alleviation among Women Questionnaire", validated by two lecturers from the Department of Home Science and Management, University of Nigeria. Data obtained were analysed in Statistical Product for Service Solution (IBM-SPSS, version 23), using descriptive statistics (frequencies, percentages, mean and standard deviation) and presented in the form of tables. The results showed that these occupations provide the women with enough income to solve their basic needs; the opportunity to develop their potential; and active participation in the LGA's decision-making on issues affecting women. Unrealistically high electricity costs; no tax relief for start-ups; and insufficient relevant skills training; were major challenges. The survey suggested in-house finishing of products, upfront payments, and resource-efficient production for businesses. On a broader scale, suggested government interventions include equipment grants, tax reliefs, and the establishment of textile mills.

Keywords*:* Clothing and Textiles, Occupations, Poverty Alleviation, Women

Introduction

Poverty is the state of being poor, that is living with a lack of money and material resources. It is a state of being poor and a social construct with a variety of facets and qualities. There is no universal definition or standard for measuring poverty. Being poor entails more than just not having enough money or other resources to support a sustainable way of life. Its symptoms include hunger and malnutrition, restricted access to basic services like education and healthcare, social marginalization and discrimination, and a lack of involvement in decision-making (United Nations, 2020). The problem of poverty has existed since

Nigeria became a nation (Nkwede, 2013). According to the Federal Office of Statistics report (1999), poverty rates in Nigeria ranged from 27% in the late 1970s to the early 1990s; and 46% in 1996. In 2017 Purchasing Power Parity (PPP) prices, the new global poverty threshold of $2.15 per person per day mirrors the typical national poverty limit of low-income countries, including Nigeria (World Bank, 2022). Slightly under 133 million people in Nigeria or 62.9% of the population, are multi-dimensionally poor, which means that they experience deprivation in at least 26% of weighted indicators (National Bureau of Statistics, 2022). Poverty impacts the health and development of children negatively. Children born into poverty are more susceptible to infant mortality, poor nutrition, congenital disorders, etc. Poverty also increases maternal mortality, crime rates, and poor literacy rates in Nigeria.

According to United Nations Women, (2020), there are 125 women for every 100 men in the age range of 25-34 years, who live in extreme poverty (Charmes, 2019). This reflects the differences in their life courses, women between the ages of 25 and 34 are particularly vulnerable due to earlier marriage and childrearing, discriminatory social norms and gender stereotypes that reinforce their role as caregivers, as well as unequal power dynamics in the household that restrict their access to resources and opportunities (United Nations Women, 2020). In addition, men and women are assigned different amounts of unpaid caregiving and domestic chores, and because time-saving equipment is not readily available, women must work longer hours to enter the workforce, endangering their health and well-being. Women spend more time doing unpaid care work than men do. The trend over 15 years indicates that women's share of the total unpaid care work decreased from 70.6% to 67.5% (Charmes, 2019). Pearce (1978) coined the phrase "feminization of poverty" to describe the disproportionately high poverty rates among women despite apparent advancements in gender equality and women's higher labour force participation (Bullock, 2013). Poverty still affects women more than males and has proven to be a very challenging issue to solve, even though some women have become financially independent of their spouses due to their engagement in the workforce. Women experience poverty more frequently than men do, as a result of gender inequality in the workplace, family responsibilities, and societal oppression of women. Women also experience poverty more severely because they are at the bottom of the labour market, particularly in rural areas where there are severe labour restrictions. Rural women are unable to carry out the tasks and play the roles that are required of them in a social, cultural, and physical context as a result of social marginalization, gender discrimination, age, a lack of expertise, having no land, and other factors. The likelihood of poverty is increased by several factors, including dangerous living and working environments, inadequate nutrition and health care, and low educational attainment (Aluko

& Mbada, 2020). Income is a significant indicator of poverty among women in both urban and rural places around the world, and family responsibilities frequently limit their ability to engage in more lucrative activities and access employment possibilities (Aluko & Mbada, 2020). Their priorities for how to measure and respond to poverty change primarily as a result of the many roles individuals play in their community, which expose them to various limits, opportunities, and needs (Jayamohana & Amenu, 2014). In rural settings, traditional gender roles, guided by Role Theory, often cast men as primary breadwinners while unduly burdening women with domestic responsibilities. Economic dependence on male partners and extended family dynamics can restrict women's financial autonomy (Biddle, 2013; United Nations Women, 2018; Gram et al., 2018). Extended family living arrangements may ease childcare duties, as younger women often turn to older female relatives for support (United Nations Women, 2020). Education, a fundamental right, equips individuals with skills and awareness that enhance health, earning potential, and decision-making. Empowering women through education is pivotal for poverty reduction (Janjua, 2014; Khan, 2015).

One of the first steps for nations making the switch from agricultural to sector, according to Wiman (2012) has historically been the clothing and textile sector (especially for women). Hence, the sector's development has significant implications for the whole economy as well as a nation's ability to grow and combat poverty. Clothing and textile-related occupations refer to jobs that require performing tasks like tailoring garments, producing knitted goods and other articles of clothing, textile crafts, textile engineering, designing, and so on. Wiman (2012) found that women make up at least two-thirds of all employees working in the clothing and textile sector, except in Bangladesh, India, and Pakistan. In nations like Bangladesh and Pakistan, where female labour force participation in the rest of the economy is low, women continue to hold higher proportions of employment in the clothing and textile sector (relative to other industries). Due to the strong influence of women's wage-earning opportunities, understanding the evolution of the clothing and textile sector has substantial consequences for the advancement of women and the fight against poverty. According to Ka'oje and Kaoje (2022), to fully comprehend and address the causes of poverty, it is important to take into account how differently men and women feel about poverty. Nkwede, (2013) reported that successive administrations have designed poverty alleviation programmes with little implementation success due to underrepresentation of the targeted poor people, policy and political instability, lack of continuity, corruption and misappropriation of government funds, and the programmes were not well designed. Such programmes that targeted women include the Better Life for Rural Women, the Family Economic Advancement Programme, and the

National Poverty Eradication Programme. In 2005, the Ebonyi State government established the Ebonyi State Community-Based Poverty Reduction Agency (EBCPRA).

With over one million Nigerians employed and more than ₦1 billion in revenue, the country's textile industry has been a significant contributor to the manufacturing sector of the economy (Owen et al., 2016). With 250 factories and a capacity utilization rate of more than 50% before 1997, it was the second largest in Africa. It had expanded to become the third largest in Africa by the 1970s and 1980s. Women have safeguarded and promoted rich cultural value and traditional designs, and Small-to-Medium-sized Enterprises are a significant driver of innovation and job development (Moungar, 2018). Global demand for African textiles and clothing is rising, and African patterns are becoming acknowledged as really fashionable and classic designs. African influences are becoming more and more prevalent in the most recent collections from international fashion businesses. Moungar (2018) further states that to profit from the global fashion value chain, African nations must industrialize quickly, and the textile and clothing sector offers significant possibilities for value additions and employment creation. National strategies to reduce poverty require democratic participation and changes in economic structures to ensure access for all, more equitable distribution of wealth and income, and social protection for those unable to support themselves (Wiman, 2012).

The level of acceptance of locally produced clothing and textiles-related goods is now high because of the high foreign exchange rate. Despite numerous obstacles like poor infrastructure, inadequate government incentives, and other issues, many people, particularly women and young people, have taken advantage of the opportunities the industry has to offer. Clothing and textile-related occupations have been a source of livelihood for many people for centuries. Seamstresses can specialize in sewing skirts, trousers, shirts, jackets, and coats are just a few examples of the many things. Others make curtains and linings, while others work with textiles to create crafts, decorative items like throw pillows, and much more. Several pieces of research have revealed that this sector provides stable revenue across the nation. Unfortunately, some regions of the nation have not utilized this business to its full potential as a means of subsistence and income generating. The government and some non-governmental organizations have tried to alleviate poverty among women by empowering them to engage in clothing and textiles-related skills acquisition programmes. Most of the time, there is rarely any kind of assessment to see if these techniques are producing the expected effects. This study, therefore, investigated if clothing and textiles-related occupations play any role in poverty alleviation among women in Abakaliki Local Government Area. Specifically, the study intends to:

1. Identify the roles that clothing and textiles-related occupations play in

poverty alleviation among women in the LGA;
2. Identify the problems encountered in the clothing and textiles industry that hinder effective poverty alleviation among women; and
3. Recommend likely solutions to the problems.

Methodology

Study design. The descriptive cross-sectional survey design was employed for the study. Cross-sectional study is a type of observational study that analyzes data from a population, or a representative subset at a specific point in time (Setia, 2016).

Study population. The study population included 555 registered businesses that are clothing and textiles related in the Local Government Area (LGA), according to the data obtained from Abakaliki Local Government Council, Nkaliki. Abakaliki LGA is one of the thirteen (13) LGAs in Ebonyi State, with its administrative headquarters in the town of Nkaliki and the council is made up of seven (7) districts, and 204 villages. The districts include Amachi, Amegu, Edda, Izzi Unuhu, Okpuitumo Ndebor, Okpuitumo Ndiagu, and Nkaleke Echara with 27, 36, 19, 30, 15, 19, and 57 villages respectively.

Sample size and sampling technique. The WHO (2013) formula for sample size calculation was employed, it yielded 228 respondents. A proportionate stratification sampling method was employed in the selection of respondents for the study from each district, herein referred to as stratum. This method was adopted because the study population's characteristics were diverse and needed to be properly represented in the sample. Each stratum was then sampled using simple random sampling in direct proportion to the stratum population.

Instrument for data collection. The structured questionnaire titled: Roles of Clothing and Textiles Related Occupations in Poverty Alleviation among Women Questionnaire (RCTROPAWQ) was developed after an extensive literature review and used to elicit information from the respondents. The questionnaire was divided into two (2) parts. Part 1 assessed their demographic data while Part 2 had three (3) sections with each addressing an objective. Items on the questionnaire were scored on a 5-point Likert scale structure which ranged from 5 "strongly agree" to 1 "strongly disagree".

Validation and reliability. The questionnaire was face and content validated by two lecturers in the Department of Home Science and Management, University of Nigeria, Nsukka. The reliability of the instrument for the study was ascertained using Cronbach's Alpha internal consistency reliability test. Data used for the test was collected from twenty (20) women who possess similar characteristics as the study population in Ebonyi LGA and a coefficient score of 0.82 was obtained. The value indicates the high internal consistency of the items.

Method of data collection. A preliminary visit was paid to the Head of Department of the Education Department/Social Welfare Unit of the LGA with an introductory letter obtained from the head of the Department of Home Science and Management, to obtain permission for the research. Two undergraduate students of Ebonyi State University who are residents of Abakaliki and speak the Izzi dialect of the Igbo language, were recruited and trained as research assistants in the distribution and administration of the questionnaires. The questionnaire was administered by hand to available respondents who were directly or indirectly working with textiles in each district. Those who were literate were given the questionnaire to fill out while those who had little education were guided to answer the questions by translating the questionnaire items to their dialect for easy understanding, and their responses were recorded. The collection was on-the-spot and all the questionnaires were received back.

Data and statistical analysis. Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics (mean ± standard deviation) were used to analyse data. The decision rule was placed at a mean score of ≥2.5, only scores up to 2.5 were accepted to have been agreed upon by the respondents.

Results

Socio-demographic characteristics of the respondents

The respondents were predominantly (47.4%) middle-aged (31-45 years), Igbo and Christian 93.5%, and 85.2% respectively, 37.4% of them were O'level holders, 60.4% were married, and 46.1% earned <120,000 Naira per annum.

Table 1 below shows that tailoring was the most common (100%) clothing and textile-related occupation in the area, followed by fabric merchandising (98.3%) and Second-hand cloth selling (96.9%), Trimming and finishing (93%), Costume designer (91.7%), Accessory designer (88.6%), Dry-cleaning and laundry (88.2%), Milliner (87.7%), and Others (68%). The respondents mostly engaged in tailoring (92.5%) and fabric merchandising (82%). The fashion designers among them constituted 20.2%, and Second-hand cloth sellers (16.2%). Dry-cleaning and laundry (0.9%), Embroidery (3.5%), and Retail store management (3.9%) were the least engaged occupations.

Table 1: Percentage responses on the existence and engagement of the respondents in clothing and textiles-related occupations

Occupations	Exists F (%)	Engaged F (%)
Tailor/seamstress	228 (100.0)	211 (92.5)
Fashion designer	148 (64.9)	46 (20.2)
Merchandiser (fabric)	224 (98.3)	187 (82.0)
Retail store manager	148 (64.9)	9 (4.0)

Second-hand clothing seller	221 (96.9)	37 (16.2)
Dry-cleaning and laundry	201 (88.2)	2 (0.9)
Embroidery	109 (47.8)	8 (3.5)
Trimming and finishing ("weaving")	212 (93.0)	17 (7.5)
Patternmaking	76 (33.3)	15 (6.6)
Accessory designer	202 (88.6)	14 (6.1)
Costume designer	209 (91.7)	19 (8.3)
Milliner (e.g. hats)	200 (87.7)	13 (5.7)
Others (e.g. cobblers, sewing machine technicians)	155 (68.0)	33 (14.5)

Table 2 shows the responses of the participants on the roles of clothing and textiles-related occupations in poverty alleviation among women. The respondents agreed that these occupations provide the women with enough income to solve their basic needs (mean = 4.24); the opportunity to develop their potential (mean = 4.20); and active participation in the LGA's decision-making on issues affecting women (mean= 4.08). The women are gainfully employed (mean = 4.07). They are equipped with the economic assets to access credits as equitably as possible with men (mean = 3.98), and there is no gender entry barrier (mean = 3.93). They are not capital-intensive to start-up (mean = 3.48); give women access to the society's elites and high-profile events (mean = 3.40), and allow women more time for leisure and household chores (mean = 3.07).

Table 2: Roles of clothing and textiles-related occupations in poverty alleviation among women

Roles	Mean (SD)	Remark
Full, productive, and decent work for women.	4.07 (2.48)	Agree
No entry barrier based on gender.	3.93 (2.11)	Agree
The demand for products/services is higher than the supply so, any woman with the interest and relevant skills can join.	3.74 (1.98)	Agree
Not capital-intensive to start-up.	3.48 (1.68)	Agree
Allow women to become employers of labour.	3.98 (2.24)	Agree
Allow women more time for leisure and household chores.	3.07 (1.15)	Agree
Equip women with the relevant skills and experience for accessing poverty alleviation programmes.	3.74 (1.80)	Agree
Equip women to access loans and grants as equitably as possible with men.	3.98 (2.24)	Agree
They allow women active participation in the LGA's decision-making on issues affecting women.	4.08 (2.44)	Agree
Provide opportunities to develop women's potential.	4.20 (2.60)	Agree
Provide enough income to solve their basic needs.	4.24 (2.68)	Agree
Give them access to the society's elites and high-profile events.	3.40 (1.28)	Agree

Give them advantageous popularity should they seek to run for political offices.	3.72 (1.91)	Agree
Allow the women the creative freedom to add value to existing business ideas and thus earn profits.	4.02 (2.44)	Agree

Table 3 shows the problems that hinder effective poverty alleviation among women. They include unrealistically high electricity costs (mean = 4.40); no tax relief for start-ups (mean = 4.20); insufficient relevant skills training (mean = 4.13); the complexity of the loan's application process (mean = 4.00); high poverty level in the area (mean = 4.00); heavy taxes (mean = 3.96); customers always patronise on credit (mean = 3.87); inadequate infrastructural facilities (mean = 3.80); shop rents were too high (mean = 3.78); and water is not easily accessible (mean = 3.56).

Table 3: Mean responses on problems that hinder effective poverty alleviation among women

Problems	Mean (SD)	Remark
The complexity of the loan application process.	4.00 (2.22)	Agree
No tax relief for start-ups.	4.20 (2.55)	Agree
Heavy taxes.	3.96 (2.12)	Agree
Inadequate infrastructural facilities.	3.80 (2.18)	Agree
The high poverty level in the area.	4.00 (2.40)	Agree
Unrealistically high electricity cost	4.40 (2.93)	Agree
Insufficient relevant skills training on machine operation, management, other technical skills, and general knowledge.	4.13 (2.47)	Agree
Shop rents are too high.	3.78 (2.08)	Agree
Water is not easily accessible.	3.56 (1.78)	Agree
Customers always patronize on credit.	3.87 (2.21)	Agree

Table 4 shows the responses on the likely solutions to the problems identified. The respondents mostly suggested that businesses can finish clothing with special seams to save outsourcing costs or energy consumed by industrial machines (mean = 4.40), and should demand that the customers make a huge part of the payment when they order a product/service (mean = 4.03). They also suggested that businesses should find creative ways to reduce the number of resources used to produce their products while maintaining quality (mean = 3.59), give discounts to encourage word-of-mouth referral instead of paying hugely for digital advertising (mean = 3.53), and manufacture some necessary raw materials (mean = 3.19). Additionally, the government should provide equipment grants and loans at low-interest rates (mean = 4.27); there should be tax reliefs for start-ups (mean = 4.20); and build textile mills and factories for raw materials production (mean = 4.19).

Table 4: Mean responses on the likely solutions to the problems identified

Solutions	Mean (SD)	Remark
The government should provide equipment grants and loans at low-interest rates.	4.27 (2.86)	Agree
There should be tax reliefs for start-ups.	4.20 (2.68)	Agree
The government should provide social welfare funds for large households with a greater number of members who are not of working age.	3.87 (2.31)	Agree
The government should build textile Mills and factories for raw materials production.	4.19 (2.69)	Agree
Government should intervene in the alleviation of poverty among residents of the LGA.	3.99 (2.30)	Agree
Clothing can be finished with special seams to save outsourcing costs or energy consumed by industrial machines.	4.40 (2.93)	Agree
Charcoal iron can be used in place of industrial steam iron to save energy.	3.30 (1.55)	Agree
Businesses can give discounts to encourage word-of-mouth referrals instead of paying hugely for digital advertising.	3.53 (1.75)	Agree
The government should review the curriculum of Home Economics subjects in schools to include practical training on machine operations.	4.00 (2.32)	Agree
The government should build model vocational schools and provide scholarships.	3.65 (1.99)	Agree
Businesses should demand that the customers make a huge part of the payment when they order a product/service.	4.03 (2.32)	Agree
Find creative ways to reduce the amount of resources used to produce their products while maintaining quality.	3.59 (1.68)	Agree
Businesses should manufacture some necessary raw materials.	3.19 (1.32)	Agree

Discussion

This study aims to explore the roles of clothing and textiles-related occupations in poverty alleviation among women in the LGA. The findings reveal that tailoring is the predominant occupation, followed by fabric merchandising and second-hand cloth selling. Other prevalent clothing and textiles-related occupations include trimming and finishing, costume designing, accessory designing, dry-cleaning and laundry, and millinery. Notably, occupations like dry cleaning and laundry, embroidery, and retail store management are less commonly pursued in the study area. Understanding the distribution of these occupations provides valuable insights for designing targeted interventions and support mechanisms to enhance economic opportunities and empowerment of women in the LGA.

The high engagement in tailoring and fabric merchandising suggests the popularity and practicality of these occupations among the women surveyed. These roles not only provide economic opportunities but also

empower women with valuable skills in the clothing and textiles sector. Fashion designers represent a niche within the broader spectrum of clothing and textiles-related occupations. This indicates a certain level of specialization within the industry, potentially leading to higher income and economic empowerment for those involved. Second-hand cloth selling showcases another niche of the clothing and textiles market. While it may signify a more informal sector, it remains a notable source of income for a significant proportion of women in the LGA. This niche may also represent the proportion of women who are part of the circular economy, which is a leading watchword in the world today. On the other hand, the lower engagement rates in occupations such as dry-cleaning and laundry, embroidery, and retail store management suggest that these roles are less prevalent or less preferred by the respondents. Further exploration could shed light on the factors influencing the choice of certain occupations over others.

The participants' responses reflect a positive perception of the roles played by clothing and textiles-related occupations in poverty alleviation among women in the LGA. Their responses showed that through clothing and textiles-related occupations, women in the LGA can be permanently lifted out of multidimensional poverty. The participants believe that these occupations provide women with sufficient income to address their basic needs. This underscores the economic significance of engaging in clothing and textiles-related activities for the surveyed women. Similarly, Yamagata (2006) observed that, in specific job categories, women constitute the majority of the labour force, earning wages well above the poverty line. Moreover, barriers to employment and promotions in these categories are low, making the garment industry an excellent job prospect for rural women, offering an alternative to low-wage economic activities.

The finding shows that these occupations offer women opportunities for personal and professional growth. They acknowledged that engagement in clothing and textiles-related occupations allows women to actively participate in the LGA's decision-making on issues affecting them. This highlights the perceived empowerment and involvement of women in community matters. Moungar (2018) emphasizes that developing their skills in these areas not only enhances economic productivity but also fosters independence, offering social and political benefits to their communities.

The women recognized that they were gainfully employed through these occupations. This emphasizes the significance of these roles in providing meaningful employment opportunities for women in the LGA. According to the respondents, these occupations equip women with economic assets to access credits as equitably as possible with men. Moungar (2018) highlights the potential for economic empowerment, particularly among women, in both rural and urban areas through active involvement in the

fashion value chain. Small and Medium-sized Enterprises (SMEs) play a vital role in job creation and innovation, contributing to decent and productive employment in future industries (Moungar, 2018).

The study findings also indicate that there is no significant gender entry barrier in these occupations, and they are not highly capital-intensive to start. Beghini and Pozzan (2019) note that the Textile Clothing Leather Footwear (TCLF) sector, compared to other industries, is characterized by a significant presence of SMEs due to lower startup costs. The women also believe that engaging in clothing and textiles-related occupations provides them access to society's elites and high-profile events, which could lead to potential social and networking benefits. These occupations are also believed to allow women more time for leisure and household chores. This suggests a perceived balance between work and personal life for women engaged in these activities. Textile Exchange (2018) asserts that the textile industry holds the potential to alleviate poverty, especially among women, and promote gender equality. Quality jobs in this sector can empower women economically, provide social protection, support work-life balance, and foster discrimination-free environments. Also, that research highlights the significant employment of women in the garment sector, contributing positively to economic growth.

The challenges hindering effective poverty alleviation among women engaged in clothing and textiles-related occupations are multifaceted and contribute to the complex dynamics of economic empowerment in this context. Unrealistically high electricity costs pose a significant financial burden on these women, impacting their overall profitability and economic sustainability. As a consequence, they are compelled to resort to manual machines, which lack ergonomic features, resulting in lower product yields and, consequently, reduced income. World Bank (2022) stated that infrastructure, especially electricity access, is crucial for market success and poverty reduction.

The absence of tax relief for start-ups adds another layer of financial strain, increasing the overall operational costs for these women. This, coupled with heavy taxes, creates a challenging financial environment that affects the profitability and viability of their businesses. Also, taxation is dependent on government policies, beyond the control of business owners. Keane and Te Velde (2008) found that the long-term contribution of the textile and clothing industry to growth and development relies on the quality and effectiveness of government policies and institutions in developing countries.

Insufficient relevant skills training on machine operation, management, other technical skills, and general knowledge, compounds the challenges, limiting the capacity of women to adapt to changing market dynamics and emerging trends. Additionally, the complexity of the loan application process exacerbates these issues, creating bureaucratic hurdles that impede access to financial resources.

Ita et al. (2018) support that education is vital for sustainable poverty reduction, offering economic development, increased income, entrepreneurship, and improved utilization of government facilities.

The high poverty level in the area further exacerbates the difficulties faced by women engaged in these occupations. It reflects a broader economic context that may limit the purchasing power of potential customers, affecting sales and income generation.

Other challenges include customer reliance on credit transactions, which impacts cash flow and creates financial uncertainties for these women entrepreneurs. Inadequate infrastructural facilities, such as poor transportation and communication networks, add logistical challenges to the operation of their businesses. Exorbitant shop rents reduce profitability, while limited access to water affects some processes in certain textile-related activities.

To address the identified challenges, respondents propose several solutions. Businesses can optimize costs by finishing clothing with special seams in-house and should request substantial upfront payments from customers. They also suggest adopting resource-efficient production methods while maintaining quality and incentivizing word-of-mouth referrals with discounts instead of heavy spending on digital advertising. Manufacturing essential raw materials is another recommended approach. On the part of the government, respondents advocate for equipment grants and low-interest loans, tax reliefs for startups, and the establishment of textile mills and factories for raw material production to foster sustainable solutions. This implies that Nigeria should manage most or the entire process of manufacturing clothing and textiles from supply to sales. The process includes turning fibres into fabrics and then into clothing and textiles with several steps at which value can be created or added. Aligning with Moungar's (2018) suggestion that to profit from the global fashion value chain, African nations must industrialize quickly, and the textile and clothing sector offers significant possibilities for value additions and employment creation. Makinde et al. (2015) also suggested that with appropriate management and attention, Nigerian textile mills have the potential to contribute significantly to the nation's growth.

Eradicating poverty demands more than anti-poverty programs; it necessitates democratic participation, economic structural changes, and policies ensuring universal access to resources, opportunities, and public services. This includes promoting equitable wealth and income distribution, offering social protection, and aiding individuals or communities facing unforeseen challenges (Wiman, 2012). Onwe et al. (2019) underscore the crucial role of government and NGOs in promoting youth entrepreneurship emphasizing the need for financial support, vocational training centres, and a conducive entrepreneurial environment to

overcome obstacles hindering youth entrepreneurship.

Conclusion

The findings underscore the significant role clothing and textiles-related occupations play in poverty alleviation among women, particularly in tailoring and fabric merchandising. Clothing and textiles-related occupations provide financial stability and foster women's active participation in decision-making. While the challenges hinder effective poverty alleviation, proposed solutions emphasize in-house finishing of products, upfront payments, and resource-efficient production for businesses. On a broader scale, suggested government interventions include equipment grants, tax reliefs, and the establishment of textile mills. These insights highlight the potential for targeted strategies to enhance the impact of these occupations and address associated challenges, contributing to sustainable poverty alleviation.

Recommendations

The following recommendations were made based on the findings of the study:

- Government should provide equipment grants and loans at low-interest rates; build textile mills and factories for raw materials production; and there should be tax reliefs for start-ups.
- The women can lease equipment to scale up.
- Women can also expand their catalog with additional products such as accessories, wigs, cosmetics, and more to diversify their income streams. This will enable them to scale their businesses more quickly and provide a fallback option during sales downturns.

References

Aluko, O. A., & Mbada, K. (2020). Rural poverty among women in Nigeria. *Journal of Sustainable Development in Africa*, *22*(3). https://www.jsd-africa.com/Jsda/2020%20V22%20No%203%20Fall/PDF/Rural%20Poverty%20Among%20Women%20in%20Nigeria%20(2).pdf

Annual Report 2019–2020. (2021). UN Women – Headquarters. https://www.unwomen.org/en/digital-library/publications/2020/06/annual-report-2019-2020

Atuekwe, A. (2018). Identification of the roles of clothing industries in national development. *Journal of Association of Vocational and Technical Educators of Nigeria (JAVTEN)*, *23*(1), 1–12. Retrieved from https://avten-edu.org.ng/journal/index.php/javten/article/view/3

Beghini, V., U, C., & Pozzan, E. (2019). A quantum leap for gender equality: For a better future of work for all. *ILO*.

Biddle, B. J. (2013). *Role theory: expectations, identities, and behaviours*. Academic Press, New York.

Bullock, H. E. (2013). *Women and poverty: Psychology, public policy, and social justice* (1st ed.). Wiley-Blackwell.

Charmes, J. (2019). The unpaid care work and the labour market: an analysis of time use data based on the latest world compilation of time-use surveys. In *HAL (Le Centre pour la Communication Scientifique Directe)*. French National Centre for Scientific Research. https:/hal.archives-ouvertes.fr/hal-02566442

Gram, L., Skordis-Worrall, J., Mannell, J., Manandhar, D. S., Saville, N., & Morrison, J. (2018). Revisiting the patriarchal bargain: The intergenerational power dynamics of household money management in rural Nepal. *World Development*, *112*, 193–204. https://doi.org/10.1016/j.worlddev.2018.08.002

Ita, V. E., Edet, L. I., & Effiong, J. E. (2018). Towards sustainable poverty reduction in nigeria: comparative benefits and the necessity of education option. *Asian Journal of Social Sciences, Arts and Humanities*, 6(1), 27. https://www.researchgate.net/profile/Victor-Ita-2/publication/361177437_towards_sustainable_poverty_reduction_in_nigeria_comparative_benefits_and_the_necessity_of_education_option/links/62a118166886635d5ccaf563/towards-sustainable-poverty-reduction-in-nigeria-comparative-benefits-and-the-necessity-of-education-option.pdf

Janjua, P. (2014). The role of education and health in poverty alleviation a cross country analysis. *British Journal of Economics, Management & Trade*, *4*(6), 896–924. https://doi.org/10.9734/bjemt/2014/6461

Jayamohana & Amenu T. K. (2014). Gender and poverty–an analysis of urban poverty in Ethiopia, development studies research, Vol. 1, No. 1, 233–243, http://dx.doi.org/10.1080/21665095.2014.91705.

Ka'oje, M. R. & Kaoje, N. A. (2022). Gender inequality and poverty reduction in Nigeria. *InternationalJournal of the Social Sciences* https://www.researchgate.net/publication/364976350_gender_inequality_and_poverty_reduction_in_nigeria_and/download

Keane, J., & Te Velde, D. W. (2008). The role of textile and clothing industries in growth and development strategies. *Overseas Development Institute*, *7*(1), 141-147. https://odi.org/en/publications/the-role-of-clothing-and-textile-industries-in-growth-and-development-strategies/#:~:text=It%20suggests%20that%20textiles%20and,in%20those%20countries%20with%20appropriate

Khan, M. T. (2015). Role of education in poverty reduction (A literature review). *InternationalJournal of Information, Business and Management*, *7*(3), 124. https://www.academia.edu/download/37674331/IJIBM_Vol7No3_Aug2015.pdf#page=129

Makinde, D. O., Fajuyigbe, M. O., & Ajiboye, O. J. (2015). Nigerian textile industry: A tool for actualising economic stability and national development. European Journal of Business and Social Sciences, 4(8), 331-344. ISSN:2235-767X

National Bureau of Statistics. (2022). Nigeria multidimensional poverty index.ttps://www.nigerianstat.gov.ng

Nkwede, J.O. (2013). approaches for poverty alleviation and sustainable development in Nigeria: A Study of Ebonyi State Community Based Poverty Reduction Agency (EB-CPRA). *International Journal of Social Science Studies*, *2*(1). https://doi.org/10.11114/ijsss.v2i1.249

Onwe F. O., Eze, E. O., & Mbam, P. E. (2019). The Need for Promoting Youth Entrepreneurship in Abakaliki Local Government Area of Ebonyi State, Nigeria. *American Journal of Social Sciences and Humanities*, *4*(2), 260-268. https://doi.org/10.20448/801.42.260.268

Owen, M.M., Ogunleye, C.O. & Orekoya, E.O. (2016). The Nigerian textile industry: an overview. *NigerianJournal of Polymer Science and Technology*, 11.99-108. https://www.researchgate.net/publication/346399442_THE_NIGERIAN_TEXTILE_INDUSTRY_AN_OVERVIEW

Pearce, D. (1978). The feminization of poverty: women, work and welfare. Urban and social change review, 11(1-2), 28-36.

Setia M. S. (2016). Methodology series module 3: cross-sectional studies. *Indian journal of dermatology*, 61(3), 261–264. https://doi.org/10.4103/ 0019-5154.182410.

United Nations (2020). Ending poverty. Available at https://www.un.org/en/sections/issues-depth/poverty/index.html, accessed on 20/9/2021.

United Nations Women (2018). Promoting women's economic empowerment: recognizing and investing in the care economy. New York: UN Women. https://docs.euromedwomen.foundation/files/ermwf-documents/8098_4.193.promotingwomen%E2%80%99seconomicempowerment-recognizingandinvestinginthecareeconomy.pdf

United Nations Women (2019). Why addressing women's income and time poverty matters for sustainable development. https://cir.nii.ac.jp/crid/1130012695298404867

Wiman R. (2012). Poverty and deprivation of children as a challenge for Finland's ... Retrieved January 18, 2022, from https://thl.fi/documents/189940/263914/FFF3C_1.pdf

World Bank Group. (2022b, September 16). *Fact Sheet: An Adjustment to Global Poverty Lines*. World Bank. https://www.worldbank.org/en/news/factsheet/2022/05/02/fact-sheet-an-adjustment-to-global-poverty-lines

World Bank. (2022). *A better future for all Nigerians: Nigeria poverty assessment 2022*. World Bank. https://doi.org/10.1596/37295

Yamagata, T. (2006). The Garment Industry in Cambodia: Its Role in Poverty Reduction through Export-Oriented Development. *Research Papers in Economics*. https://www.researchgate.net/profile/Tatsufumi_Yamagata/publication/5141229_The_Garment_Industry_in_Cambodia_Its_Role_in_Poverty_Reduction_through_Export-Oriented_Development/links/09e4150f73a938b725000000.pdf